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Field Evaluation of a Low-NO(sub X) Firing System for Tangentially Coal-Fired Utility Boilers

Combustion Engineering, Inc., Windsor, CT

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FIELD EVALUATION OF A LOW-NO_x FIRING SYSTEM FOR TANGENTIALLY COAL-FIRED UTILITY BOILERS

by

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ABSTRACT

This report presents the findings of a full-scale utility demonstration of Combustion Engineering's Low-NO_x Concentric Firing System (LNCFS) conducted at Utah Power & Light's 400 MWe Hunter No. 2 boiler. This program was implemented to investigate and evaluate the effectiveness of employing concentric (offset) firing to reduce NO_x emission levels from tangentially coal-fired utility boilers.

The test program covered a period from August, 1981 to March, 1984 and included six short-term boiler characterization test series, and four long term thirty-day continuous emissions monitor (CEM) tests. A total of 384 characterization tests were conducted during the six test series analyzing boiler performance and emissions as functions of excess air, load, fuel elevations in service, burner tilt, overfire air flow, overfire air tilt, offset angle and fuel-air flow. Additionally, furnace wall corrosion was monitored, both short-term (with corrosion coupons), and long-term (with wall thickness measurements), by Exxon Research and Engineering Co., under a separate EPA contract (68-02-2696).

Overall results from the program have shown NO_x emissions levels of about 0.4 lbs NO_x per million Btu for the thirty-day continuous monitoring periods and about 0.3 lbs NO_x per million Btu for the short-term optimization tests. These levels represent 33% and 50% reductions in NO_x emissions levels, respectively, from baseline standard operating procedures.

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SUMMARY

Emphasis on improved quality of the environment has led to the design of new and unique methods of reducing NO_x emissions from coal-fired steam generators. This report presents the findings of a full scale utility demonstration of one of these methods. This program was conducted at Utah Power and Light Company's 400 MWe Hunter No. 2 Generating Station. The method demonstrated was Combustion Engineering's Low-NO_x Concentric Firing System (LNCFS). This project was sponsored by the United States Environmental Protection Agency to ascertain the capability of achieving the EPA future research goal of 0.3 pounds of NO_x per million Btu with concentric (offset) firing. The program covered a period from September, 1980 to March, 1984. During this program a baseline and five post-modification short-term (half hour) characterization test series were conducted. This included a total of 384 tests. Included in the characterization tests were examinations of emissions as functions of excess air, boiler load, fuel elevation in service, burner tilt, overfire air flow, overfire air tilt, offset angle and fuel-air flow. In addition, four long term thirty-day continuous emissions monitoring (CEM) tests and short and long term waterwall corrosion tests were conducted.

The Low-NO_x Concentric Firing System was designed for applications to tangentially fired boilers which currently represent about half the steam-electric generating capacity in the U.S. and are attributed with producing approximately 40 percent of the NO_x emissions from coal-fired utility boilers.

The principal behind the LNCFS is the aerodynamic control of the mixing of the fuel and the combustion air to stage the burning process. Using this design, control is achieved by directing a portion of the combustion air away from the fuels ignition and devolatilization zone such that this zone is fuel rich and conducive to the in-flame NO_x reduction phenomena. The project provided for the engineering design of the LNCFS, procurement and installation of the required materials, development of a test program, observation, consultation, and results evaluation during emissions testing. Further,

boiler performance was evaluated in addition to determining the NO_x reduction potential. In particular, combustion and boiler efficiencies and carbon monoxide and unburned hydrocarbon emissions were monitored. Some of the principal results are discussed below.

Baseline Boiler Characterization

Normal baseline operating conditions of full load, no overfire air and 4.5% to 5.0% excess oxygen produced NO_x emissions of 450 ppmv to 460 ppmv (adjusted to 3% oxygen). Changing the excess oxygen (or equivalent excess air) by one percent changed NO_x emissions by about 45 ppmv or 55 ppmv without and with overfire air, respectively. Overfire air reduced NO_x by between 75 and 100 ppmv. Minor but definite NO_x effects were shown for changes in burner tilts, overfire air tilts, fuel-air flow and fuel elevation in service. No effect in NO_x was shown to be directly applicable to load changes.

The NO_x reductions for all of these parameters are approximately additive. As such, the lowest NO_x emissions achievable without degradations to boiler performance were approximately 300 ppmv (adj. to 3% oxygen). The conditions set to achieve this value were full load, 3.0% excess oxygen and full overfire air.

Post-Modification Characterization

During the post-modification characterization NO_x emissions levels of 200 ppmv to 220 ppmv were achieved at full load, full OFA and the OFA tilted up. This level was also achieved repeatedly for boiler loads between 370 MWe and 380 MWe which appears to be the optimum boiler load condition for achieving low-NO_x emissions. With horizontal overfire air tilts, which is recommended for long term operations, NO_x emissions levels of 250 ppmv are more typical. Operating without overfire air yielded NO_x emissions of 300 ppmv for the second generation low-NO_x firing system with the flame holders. For reduced load operations, a NO_x level of 320 ppmv to 350 ppmv would be more typical because of reduced overfire air and increased excess air.

The parametric examination revealed that with the modifications, a one percent change in excess oxygen now changed NO_x by about 65 ppmv. Overfire air reduced NO_x by about 80 ppmv. Closer ignition front stabilization with flame holders reduced NO_x by about 50 ppmv. And finally, utilization of the offset firing system in conjunction with overfire air appeared to have a synergistic NO_x reduction effect of an additional 50 ppmv beyond the overfire air levels.

The results have also shown that there may be a lower limit for the NO_x emissions for the test unit configuration, fuel type, and fuel system design. It appears that this low threshold is at approximately 170 ppmv to 180 ppmv.

With respect to boiler performance, there appears to be no significant changes between the baseline and the post-modification operation. Reduced excess air levels have slightly improved boiler efficiency and the flame holders appear to have improved low-load ignition stabilization. But steam temperature control and combustion efficiency levels have been unchanged for normal operating conditions.

Thirty-Day Continuous Emissions Monitoring Tests

The 30-day continuous emissions monitoring (CEM) system was employed four (4) times during the low-NO_x test program. Flue gas emissions of NO_x, O_2, CO, and CO_2 were monitored continuously and logged on 15-minute intervals throughout the tests. The principal goal of these tests was to provide an overall determination of flue gas emissions during normal boiler load cycling over an extended period. These results would better quantify the emissions for normal boiler operating condition than the short-term closely scrutinized characterization tests.

NO_x emissions for the four tests at this unit averaged 0.41 pounds per million Btu fired for the thirty-day rolling averages when firing under normal low-NO_x operations. The mean boiler load for this result is approximately 70 percent of the unit design rating. This result also exhibits the difference between short-term controlled characterization tests (NO_x levels down to below 0.3 pounds per million Btu) and long term normal operations.

Corrosion Tests

Low-NO$_x$ boiler operation with the concentric firing (LNCFS) system and overfire air does not detrimentally effect furnace waterwall material wastage rates. This was shown with over 1,000 ultrasonic wall thickness measurements. There did appear to be a slightly higher wastage rate at higher furnace elevations compared to the lower furnace/hopper region. However, in all cases the loss rate was less than 2 mils per year (MPY) and for the whole boiler average the loss rate was 0.75 MPY. Also, near-burner wastage rates on the downstream side of the fuel jets, though higher than the whole boiler average, were less than 2 MPY.

The use of corrosion probes yielded only qualitative trends even after 1000 hours of testing. The wastage rate results from the probe tests were conservative (higher) when compared to the actual UT results. The probe method did show that Hastelloy C-276 coating or chrome plating did not reduce wastage. The probes also appeared to show that Type T-22 2-¼% chromium-molybdenum steel has a marginally lower long term wastage rate than Type SA-210 carbon steel.

Therefore, because each tube has a nominal wall thickness of approximately ¼ inch, the wastage rates measured under this program, approximately 3/4 mils per year (0.00075 inches), would not be expected to effect the boilers design life of 30 years.

INTRODUCTION

Tangentially coal-fired utility boilers account for about half the steam-electric capacity generated in the U.S. by coal-fired utility boilers and produce about 40 percent of the NO_x emissions attributed to coal-fired utility boilers. Current combustion modification technology for tangentially fired boilers is with overfire air (also called staged combustion). This technique is capable of meeting the current New Source Performance Standards of 0.6 and 0.5 pounds of NO_x per million Btu fired for bituminous and subbituminous coals, respectively. However, it appeared that overfire air technology would not be capable of meeting future EPA research goals of approximately 0.3 pounds of NO_x per million Btu. EPA-sponsored low-NO_x coal burner development programs for wall-fired boilers were already underway and showed promise of meeting the research goal. A field evaluation of a low-NO_x coal burner on a wall-fired boiler was being formulated. Development of advanced low-NO_x burners for tangentially fired boilers lagged the wall-fired burner development by several years primarily due to R&D funding constraints.

In response to this technology gap, two independent research programs were simultaneously conducted. First, the EPA's Industrial Environmental Research Laboratory at Research Triangle Park, NC, awarded Contract 68-02-1885 to the Acurex Corporation in September 1978 for pilot-scale development of low-NO_x firing systems applicable to tangentially coal-fired utility boilers. A 293 kWt (1 x 10" Btu/hr) pilot-scale furnace was used to develop a firing method which ultimately achieved low NO_x by directing the fuel and a fraction of the secondary combustion air into the center of the furnace, with the balance of the secondary combustion air directed horizontally and parallel to the furnace walls. This separation of fuel and air created a fuel-rich zone in the center of the furnace where NO_x production was minimized. Under these conditions, NO_x emissions were controlled to a level of 0.25 lbs NO_x per million Btu -- a reduction of 58 percent relative to the conventional mode of tangential firing. An additional benefit of the combustion modification is that it places a blanket of air along the furnace walls which reduces the potential for waterwall slagging and corrosion.

And second, during this same time frame, Combustion Engineering, Inc., independently conducted field tests of these combustion modification techniques on the 61 MWe Whitewater Valley No. 2 unit of Richmond (Indiana) Power and Light Company. A variety of air injection angles were evaluated. NO_x reductions of up to 40 percent were achieved at full load using simulated overfire air operation along with a secondary air injection angle of 35 degrees off the fuel firing angle.

Based on these successful pilot-scale and field trials, EPA Contract 68-02-3655 was awarded to Combustion Engineering, Inc., in September 1980 for the design, fabrication, and installation of a low-NO_x firing system on the 400 MWe Unit 2 of Utah Power and Light Company. The system became operational in October 1981, less than 13 months after the contract was signed.

Performance and emissions testing of Hunter Unit 2 together with an assessment of waterwall corrosion rates was conducted by Exxon Research and Engineering Company under EPA Contract 68-02-2696 with supporting efforts by Combustion Engineering. Pre-modification tests were conducted to establish baseline performance and emission levels of the unit. Extensive post-modification tests were conducted to determine performance and emission levels with the low-NO_x firing system. On-site performance testing, conducted in several phases, encompassed a period of about 2 & 1/2 years. After optimization of the system, full-load NO_x emissions were controlled to a level of about 0.3 pounds of NO_x per million Btu -- a reduction of 53 percent from previous operating levels on this unit. The results of four 30-day continuous monitoring tests averaged 0.41 pounds of NO_x per million Btu over a load range of 200 to 360 MWe (about 50 to 90 percent of full load).

Detailed results of this full-scale evaluation are presented in this report.

PART A

PROGRAM INTRODUCTION, APPROACH AND DETAILED DESCRIPTION OF TEST UNIT: UP&L HUNTER NO. 2

I. INTRODUCTION

The advent of federal NO_x emissions regulations for steam generators in 1971 led to the development of various innovations in NO_x reduction techniques. The inherently low-NO_x emissions characteristics of Combustion Engineering's tangential firing system afforded C-E the capability to meet the original EPA regulation level of 0.7 pounds NO_x per million Btu of coal fired with only minor operational changes. The NO_x emissions level that is currently allowed by the 1979 New Source Performance Standards (NSPS), 0.6 and 0.5 pounds of NO_x per million Btu fired for bituminous and subbituminous coals, respectively, can be met in most cases by the use of overfire air (OFA) and correct fuel nozzle spacing. However, in order to meet the EPA research goal of 0.3 pounds NO_x per million Btu it appeared necessary that additional coal firing system development had to be conducted. This development has been conducted in three phases. The first phase was conducted at a one-million Btu per hour pilot-scale facility under EPA sponsorship. The second phase was conducted in parallel at a 61 MWe municipal utility by Combustion Engineering.

The success of these two programs led to EPA sponsorship of the third phase of this program, a full scale utility demonstration. EPA contract (No. 68-02-3655) was issued in September, 1980 to Combustion Engineering, Incorporated (C-E) to modify the firing system of an existing pulverized-coal tangentially fired utility steam generator to the low-NO_x Concentric Firing System (LNCFS). The principal behind the LNCFS is the aerodynamic control of the mixing of the fuel and the combustion air to stage the burning process. Using this technique, NO_x control is achieved by directing [illegible]ortion of the combustion air away from the fuels ignition and devolatiliz[illegible]on zone such that this zone is fuel-rich and conducive to the in-flame NO_x reduction phenomena.

The project provided for the engineering design of the LNCFS, procurement and installation of the required materials, development of a test program, observation, consultation, and results evaluation during emissions testing and maintenance/partial restoration of the host unit. In addition to determining the NO_x reduction potential, boiler performance was to be evaluated. In particular, combustion and boiler efficiencies, carbon monoxide and unburned hydrocarbon emissions were to be monitored.

Actual boiler monitoring for emissions, both gaseous and particulate, corrosion testing and 30-day continuous emissions monitoring were conducted by Exxon Research and Engineering (ER&E) Company under a separate contract to the EPA, (Contract No. 68-02-2696). This project has been completed separately and only pertinent summaries have been included in this report.

II. PROGRAM APPROACH

To achieve the purpose and objective of this study, five major tasks were completed.

- Engineering Design of the LNCFS
- Development of a Test Matrix and Engineering Support During Baseline Boiler Testing
- Component Fabrication and Installation
- Development of a Test Matrix and Engineering Support During Post-Modification Boiler Testing
- Unit Maintenance/Partial Restoration

In the engineering design phase of the project, the results of the pilot scale testing at Acurex Corporation done under EPA Contract 68-02-1885 and by C-E field testing of a 61 MWe steam generator were considered and evaluated.

The purpose of this evaluation was to develop the functional requirements of the low-NO_x firing system. These requirements also took into account the design practices for tangentially fired utility steam generators. This included analyzing the effects that a low-NO_x system would have on the overall firing system design and boiler operation. In particular, excess air, primary air/fuel ratio, secondary air velocity, amount of diverted air, fuel firing angle, primary air velocity, fan performance, slagging, fouling, waterwall corrosion, carbon burnout, and superheater and reheater temperature control were determined to be prime variables which had to be accounted for in the design and/or monitored closely during the testing.

For the second task of the program, baseline test planning and subsequent actual testing of the host site were conducted to characterize the unit. This evaluation was used to determine the host-site's emissions and thermal performance prior to the low-NO_x modifications.

?x

The variables and data points to be collected were defined during the test planning. This matrix was coordinated with Exxon Research and Engineering (ER&E) who had been contracted to perform the emissions and boiler operations monitoring. Two unit load conditions (full load and 75% load) were examined with dependent parameters of excess air, overfire air (OFA), burner and OFA tilts, and combustion air distribution. Measurements were made of boiler operating data such as superheater and reheater conditions, steam flow, air and gas flows and temperatures and auxiliary equipment operations. Emissions measurements were taken for CO, CO_2, NO, NO_2, O_2, unburned hydrocarbons and particulate measurements.

For Task 3 the low-NO_x Firing System was fabricated and installed as per the design features specified in Task 1. The unit was started up and the operation of the low-NO_x system was checked out.

The purpose of Task 4 was to develop a post-modification test matrix to characterize emissions and boiler performance changes resulting from the low NO_x unit modifications and, to provide engineering support to ER&E in setting up boiler conditions and interpreting results throughout the post-modification testing. During this phase five different comprehensive test series were conducted. The first post-modification test series primarily analyzed the low-NO_x firing system (LNCFS) as a function of operating parameters other than overfire air. The second test series analyzed the low NO_x system with overfire air and overfire air tilts as additional parameters. The third test series analyzed a modified design of the low NO_x system which included fuel nozzle flame holders or diffusers, (refer to section A-IV for description of windbox modifications). The fourth series analyzed performance at reduced load and recommended low-NO_x normal boiler operations. And, the fifth series checked the performance of the partially restored boiler which maintained the concentric (offset) firing capability with a partially modified fuel compartment.

For the fifth task of this program it was initially planned that the host unit would have been restored to its original configuration at the operator's/owner's option. The owner, Utah Power and Light Company accepted the modifications and, therefore, this task per se was not required. Periodic maintenance and a partial restoration was performed.

Additionally, in conjunction with this program, ER&E was conducting waterwall corrosion studies and continuous emissions monitoring of the host unit. Summaries of this work have been included in this report.[1]

Waterwall corrosion was evaluated using two methods, wall thickness measurements and waterwall corrosion probes. The wall thickness measurements involved a ultrasonic thickness (UT) mapping of all walls throughout the furnace. This mapping occurred during normal boiler outages both before the low-NO_x modification was installed and during the partial restoration outage immediately prior to the final emissions test series. This method provides for a better evaluation of the corrosion potential than the corrosion probes.

Corrosion probes were used as short-term corrosion quantifiers for periods of between thirty (30) and one thousand (1000) hours. This testing was conducted after the low-NO_x mode of operation had been determined. Corrosion probes consist of temperature-controlled test coupons made of

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1. Detailed results of these tests are available in the project report for EPA Contract No. 68-02-2696. The title of this report is Long Term Optimum Performance/Corrosion Tests of Combustion Modifications for Utility Boilers - Host Site: Utah Power & Light Company, Hunter No. 2

several different types of material. The probes are placed in the furnace walls for various lengths of time and then examined to determine the rate of metal loss. As a general rule, longer exposure yielded truer corrosion rates.

The 30-day continuous emissions monitoring (CEM) system was employed four (4) times during the low-NO_x test program. NO_x and other flue gases were monitored continuously for these tests. These CEM tests are used to provide an overall determination of flue gas emissions over normal boiler load cycles for the full 30-day period. The results serve as a better long-term emissions quantifier than the short-term characterization tests.

III. BOILER DESCRIPTION

Utah Power and Light Company's Hunter Station is located in Emery County of East-Central Utah at an elevation of 5,800 feet above sea-level. It is located adjacent to the Wasatch Ridge which is the source for the coal-fired at the plant. Unit No. 2 at this station was chosen for the demonstration site. This unit is a 400 MWe (nominal gross generator output) coal-fired steam generator that is representative of a typical boiler design by Combustion Engineering, Inc. during the 1970's. The unit was contracted in 1974 and commercial operation started in 1980.

Pollutant emissions are controlled at the unit via combustion techniques and flue gas emissions equipment. In particular, sulfur is controlled with wet flue gas desulfurization (FGD) and particulates are controlled with an electrostatic precipitator (ESP). NO_x emissions can be controlled with the overfire air registers incorporated in the burner windboxes to meet the as built New Source Performance Standard (NSPS) compliance level of 0.7 pounds of NO_x per million Btu fired.

A side elevation of the Hunter unit is shown in Figure 1. The furnace is a single rectangular cell with a width and depth of 51.66 feet and 44.33 feet, respectively. Fuel and combustion air enter the furnace through windboxes (a typical windbox configuration is shown in Figure 2) located in each of the four corners. Coal is pulverized to a fineness of 70% passing through a 200 mesh sieve and partially dried in any of the five pulverizers and transported with air at approximately 165°F to one of the five fuel elevations in each windbox. That is, one fuel elevation consists of four burners, one located in each windbox, for a total of twenty (20) burners on five elevations. Each windbox is 32 inches wide and 412.5 inches high. Each of the fuel elevations is 34 inches high and each intermediate auxiliary air compartment is 39.25 inches high. Each of the two independently controlled overfire air compartments is 21.25 inches high and they are located directly above the top auxiliary compartments.

Combustion air enters the furnace through any of four distinct locations in the windboxes. Primary air is used to transport the coal and enters the furnace through each of the 20 coal burners. Secondary air at 525°F enters the furnace either as fuel air, auxiliary air or overfire air. Fuel air passes through the fuel compartments and enters the furnace coannular to the coal and primary air stream. Auxiliary air passes through intermediate auxiliary compartments located between each fuel elevation and above and below the top and bottom fuel elevations, respectively. The overfire air enters through the top two overfire air compartments of each windbox. The distribution of secondary air is controlled by compartment dampers located at the entrance to the windbox.

Boiler lightoff and low load stabilization is conducted with one elevation of warm-up oil guns firing light fuel oil. This warm-up elevation is located in an auxiliary compartment between the lowest two coal elevations. In addition, each of the upper three coal elevations have individual oil-fired main burner ignitors.

Coal for the plant is usually procured from two Wasatch Ridge deep shaft mines, the Des-B-Dove mine and the Wilberg mine. They are fired as a blend with Des-B-Dove about 30 percent and Wilberg about 70 percent of the blend. Both coals have similar compositions and are classed as High Volatile-B Western Bituminous coals.

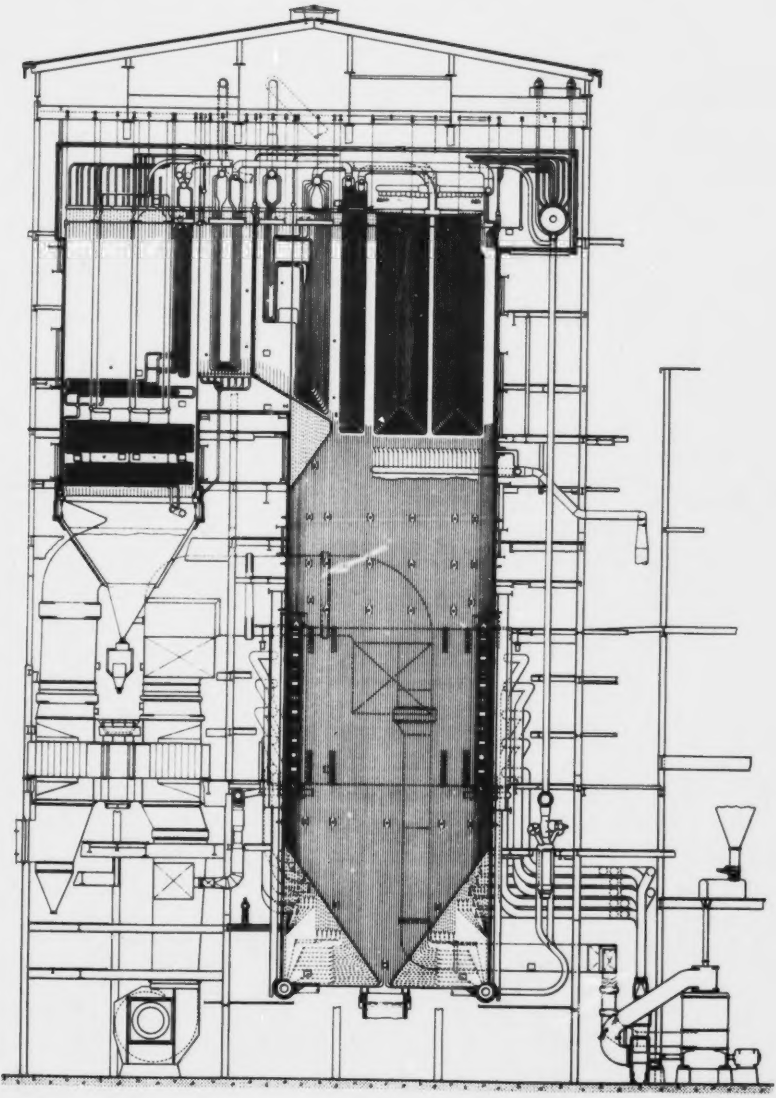


Figure 1. Side elevation of Utah Power and Light Company's Hunter No. 2.

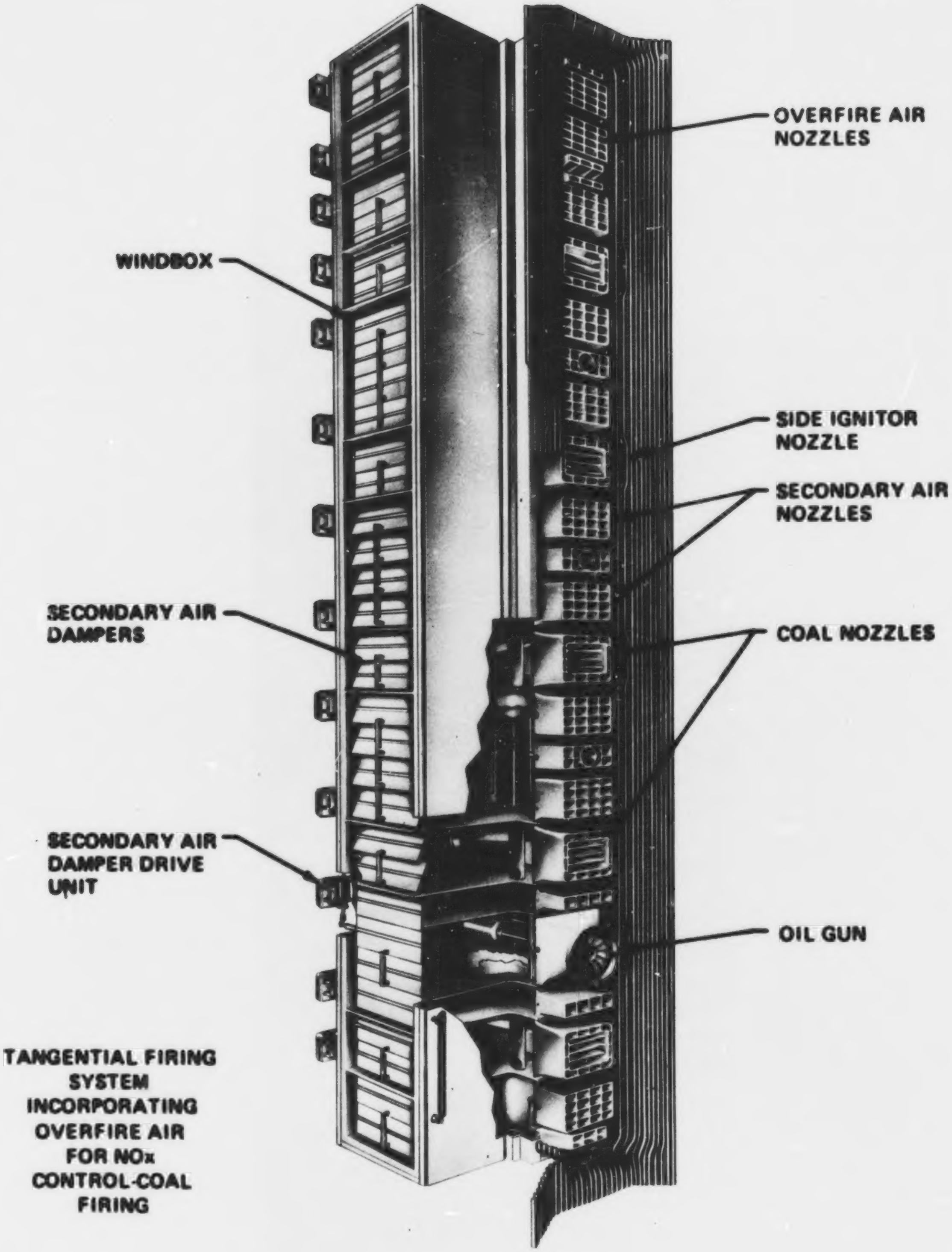

OVERFIRE AIR NOZZLES
WINDBOX
SIDE IGNITOR NOZZLE
SECONDARY AIR NOZZLES
SECONDARY AIR DAMPERS
COAL NOZZLES
SECONDARY AIR DAMPER DRIVE UNIT
OIL GUN
TANGENTIAL FIRING SYSTEM INCORPORATING OVERFIRE AIR FOR NOx CONTROL-COAL FIRING

Figure 2. Typical five coal elevation corner windbox with overfire air.

A full load fuel rate of approximately 180 tons of coal per hour produces 3,318,000 pounds of superheated steam per hour at conditions of 1005°F and 2645 psig. Reheater outlet flow rate and conditions are 2,704,529 pounds per hour at 1005°F and 605 psig. Superheater outlet temperature is controlled by desuperheat spraying. Reheater outlet temperature is controlled primarily with the use of vertical burner tilts and secondarily with desuperheat (tempering) sprays.

Burner tilts, as stated above, are used to control reheater steam outlet temperatures. All burner nozzle tips and auxiliary nozzle tips tilt in unison automatically and can be modulated to plus or minus 25° from horizontal. The overfire air compartments have manual tilts and a tilt range of plus 30° to minus 15°.

Ash in the coal is removed from the furnace either as bottom ash or flyash. Bottom ash is primarily composed of slag shed off the furnace waterwalls and mineral matter (principally coal mine overburden and underburden). Bottom ash usually represents less than twenty (20) percent of the total ash flow. Flyash, representing about eighty (80) percent of the ash flow is removed from the flue gas stream in the economizer hopper, air heater hopper, or primarily in the electrostatic precipitator (ESP).

IV. WINDBOX MODIFICATIONS

As stated previously, the objective of the first task of this program was to determine functional requirements and key design features of a low NO_x firing system for a tangentially fired utility boiler. The requirements of the low-NO_x firing system are based upon current design practices for tangentially fired utility steam generators and upon information that is currently available with regard to NO_x reduction research and technology. The two general requirements for the low-NO_x firing system are, first, to show that NO_x emissions are reduced as a result of implementing the system and second, to have no adverse effects on the performance of the host steam generator.

These general requirements and more specific requisites relating to the system will be elaborated upon in the ensuing pages, however, a discussion presenting the theoretical background on the formation of nitrogen oxides and the parameters affecting this formation is appropriate.

NO_x Formation

As Levy, et al. stated (8), "the formation of nitrogen oxides during coal combustion is a complicated process involving contributions both from the fixation of atmospheric nitrogen (thermal-NO_x) as well as from the oxidation of nitrogen bound chemically in the fuel (fuel-NO_x)." The formation of nitric oxide via the thermal fixation of atmospheric nitrogen has been shown to be adequately represented by the highly temperature dependent chemical reaction of the Zeldovich mechanism.(1-4) The rate of formation is exponentially dependent on temperature and is proportional to the square root of oxygen concentration. Both, reducing the amount of oxygen available to the fuel and reducing the combustion temperature, are effective methods of controlling NO_x formation via the thermal mechanism.

Although only a fraction of the fuel nitrogen is converted to NO_x , fuel NO_x can represent a major fraction of the total NO_x formed when firing a high nitrogen content coal in a conventional steam generating unit. In a tangentially fired unit, fuel NO_x accounts for 30 to 55% of the total NO_x emission for the low moisture, high rank coals, and for 50 to 75% of the total NO_x emission for the high moisture, low rank coals.(4) Thus, in pulverized coal firing, fuel nitrogen conversion is an extremely important source for NO_x formation.

Several areas of NO_x formation that are not being accounted for in this study are the coal properties and burning characteristics affecting NO_x. A fuel-associated property which can have an indirect but significant effect on thermal-NO_x formation in a furnace firing pulverized coal is the coal ash characteristics. Various parameters, including the gravity fractionation and acetic acid soluble measurements along with more conventional base/acid, iron/calcium, silica/alumina ratios and ash fusibility measurements are considered when evaluating the slagging propensity of a particular ash. If the composition and distribution of mineral matter combined with local stoichiometries and gas temperatures results in a sufficiently sintered or molten deposit, the cleanability can suffer causing a significant layer of ash to be formed on the waterwalls. As the deposit builds up, the insulating effect of the ash will reduce waterwall absorption rates, thereby causing an increase in the furnace combustion temperature. As a result, thermal-NO_x formation will increase. Changes in furnace wall conditions have been observed to produce 100 ppm differences in the NO_x emission level on a given coal fired unit. (5)

Further, many high iron coals with a potential to deposit ash on the furnace waterwalls in the firing zone must be fired at higher excess air levels to ensure an oxidizing atmosphere thereby raising ash fusion temperatures and minimizing the potential for ash deposits which can lead to corrosion. Consequently, coal ash properties indirectly affect NO_x formation since potential slagging associated with the ash may severely limit and preclude the gross reduction of excess air as a means of limiting NO_x reduction. (Use of a reduced amount of excess air as a NO_x reduction process will be shown later.)(5)

One other fuel property that has a significant effect on NO_x formation is the coal oxygen to coal nitrogen ratio. The oxygen content of coals found in the United States varies significantly. The oxygen content of the low rank Western sub-bituminous coals is three to four times that of the higher rank bituminous coals. Additionally, the nitrogen content decreases only slightly with decreasing rank. Consequently, the coal oxygen-to-nitrogen ratio increases as rank decreases. As a result, the degree of conversion of coal bound nitrogen, in general, increases with decreasing rank.

As a consequence, it is highly conceivable that a lower nitrogen content Western sub-bituminous coal might exhibit a higher fuel-NO_x formation level than a higher nitrogen content Eastern bituminous coal would exhibit.

Figure 3, which shows fuel-NO_x formation as a function of the coal oxygen-to-nitrogen ratio and the coal nitrogen content, illustrates this possibility.

Of specific importance here is the realization that even in a diffusion flame where the combustion air is gradually entrained along the length of the flame, the lower limit of NO_x emission attainable may be controlled by the presence of the oxygen and the nitrogen contained in the coal itself.(6,7) On a tangentially fired unit, the pulverized coal is conveyed from the mills to the furnace in an air-stream with typical air-to-coal ratios of 1.5 to 2.0 pounds of air per pound of coal. Since this stream represents about 15 to 20 percent of the total combustion air, oxygen contained in the coal itself can represent a significant source of oxygen in the early stage of devolatilization and combustion. For a high oxygen Western subbituminous coal, the coal oxygen can constitute up to a third of the total available oxygen in the mill air/pulverized coal stream. Additionally, the coal bound oxygen is in more intimate contact to the coal bound nitrogen.

The next step in determining the most effective method of lowering NO_x by optimizing combustion conditions is to relate how these parameters affect the NO_x formation process. It is recognized that combustion of the bulk of the pulverized coal particles occurs in three main stages: evolution of the volatile components or devolatization, followed by homogeneous volatile combustion, and finally, heterogeneous combustion of the residual char. Although the stages may overlap it is clear that char combustion is generally of much longer duration than volatile combustion. (Very fine coal particles can begin to burn heterogeneously in the early stages during the evolution of the volatile matter. Refer to Figure 4). Based on this model, the conversion of coal-nitrogen to NO_x can, therefore, also be regarded as a three-stage process: coal-nitrogen devolatilization, volatile-nitrogen combustion, and char-nitrogen combustion. It is evident that the extent of devolatilization prior to ignition and the distribution of nitrogen between char and volatiles will strongly influence NO_x emissions.(8) (See Figure 5).

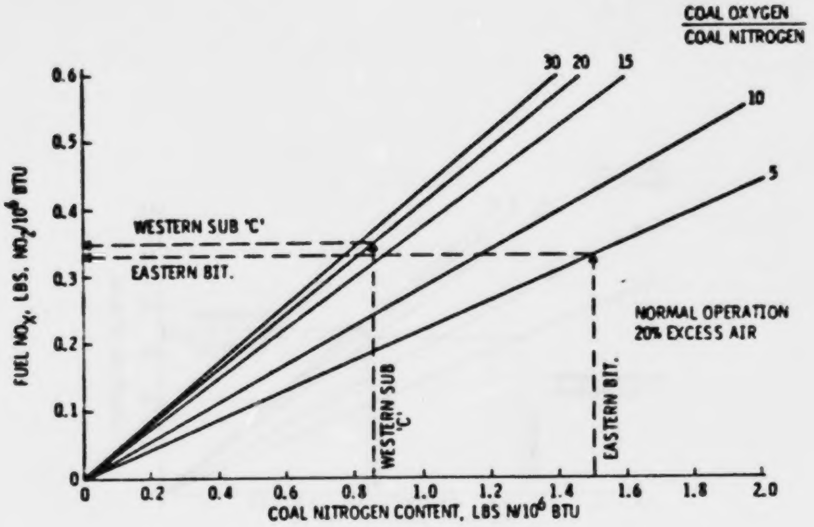


Figure 3. Fuel NO_X formation as a function of the coal oxygen-to-nitrogen ratio and the coal nitrogen content.

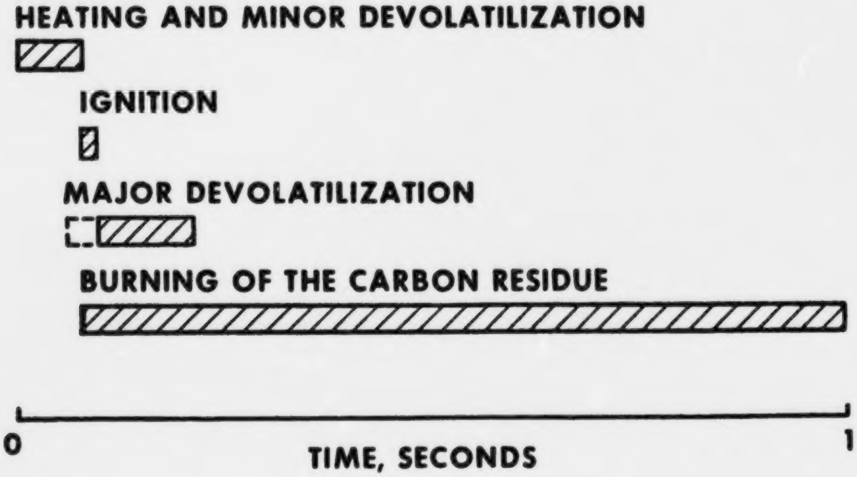

HEATING AND MINOR DEVOLATILIZATION
IGNITION
MAJOR DEVOLATILIZATION
BURNING OF THE CARBON RESIDUE
0
1
TIME, SECONDS

Figure 4. Chronology of the combustion process.

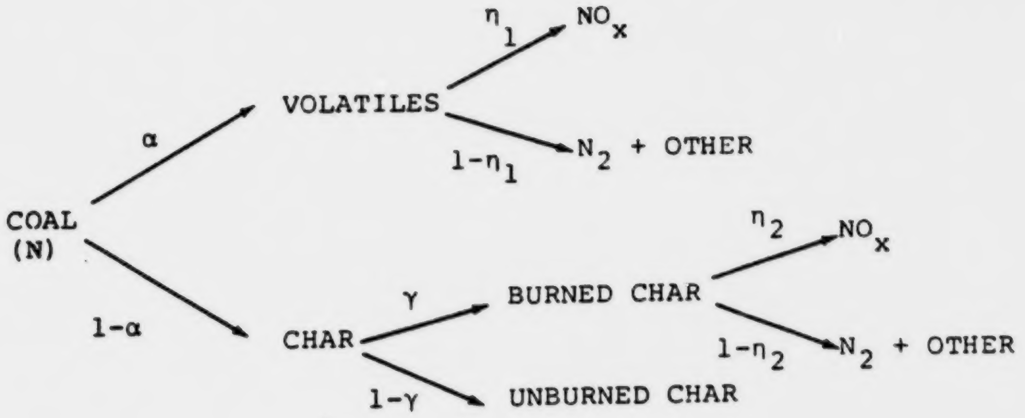

COAL (N)
α
1-α
VOLATILES
η1
NOx
1-η1
N2 + OTHER
CHAR
γ
BURNED CHAR
η2
NOx
1-η2
N2 + OTHER
1-γ
UNBURNED CHAR

Figure 5. Evolution of coal-nitrogen during the firing process.

Studies conducted prior to 1977 (9,10,11,12) relating the distribution of coal nitrogen between volatiles and char during pyrolysis and oxidation were usually limited to fluidized bed and coking conditions with temperatures below 1750°F. More recent work by Levy, Pohl, Sarofim, and Song (1978) at pulverized coal firing conditions, higher temperatures, longer residence times, particle reactions, and higher heating rates, has led to the conclusion that much of the fuel-nitrogen may be devolatilized at these higher temperatures. This result was contrary to extrapolation of data conducted previously using fluidized-bed combustors. These new results, taken independently, do not have much bearing on the reduction of NO_x emissions because fuel-NO_x has been shown to be fairly independent of temperature. However, they have led to research into studies relating to the delayed introduction of combustion air (staged firing) as a NO_x reduction mechanism.

The NO_x reduction strategy that Levy, et al. (1978) has developed for a single stage combustor is to increase the fuel/air ratio to the limit imposed by the emission of unburned carbon, CO, or soot. In a staged combustor, the strategy for decreasing the conversion of fuel-nitrogen to nitric oxide is to increase the fuel/air ratio initially which results in decreases in conversion efficiency of the fuel-nitrogen to nitric oxide for the nitrogen content of the volatiles. Since char oxidation is slow and nitrogen retained in the char may be oxidized to nitric oxide in a second stage, it is advantageous to operate the first stage at high temperatures to devolatilize the coal nitrogen in the locally fuel-rich environment. The second stage should be fuel-lean and at a low temperature (keeping excess air to the smallest amount possible without creating excessive carbon losses). The staging can, of course, be achieved either by introduction of the combustion air at different positions in a furnace or by aerodynamic means.

Another study in which NO_x reduction mechanisms were researched using pulverized coal firing conditions is titled Burner Criteria for NO_x Control, authored by Heap, et al. (1976).(13) They studied various flame processing techniques to determine the optimum firing conditions for the reduction of NO_x including the staging of combustion air as stated above.

The first priority would be to minimize the amount of primary air contained in the coal jet. (The optimum amount of primary air was experimentally determined to be approximately 20% of the stoichiometric requirements). Next, it would be desirable to stabilize the ignition front as close to the injector as possible. This is desired because the presence of the ignition front and the associated heat release acts as a driving force to remove the volatile bound nitrogen from the coal particle and a close ignition point will maximize the release of the volatile nitrogen in a fuel-rich atmosphere. Whereas, without an early stable ignition front, as the fuel jet progress downstream additional oxygen may be entrained in the fuel jet resulting in higher NO_x.

It can be seen that many of the conditions that tend to provide the high intensity combustion and rapid burnout desired for practical systems also produce high NO_x emissions.

Design Criteria for Practical Low-NO_x Firing System

The low-NO_x firing system should not increase emissions of other pollutants such as CO, UHC, and unburned carbon in the particulate matter contained in the flue gas and bottom ash. This is a requirement pertaining to system efficiency; for if the amounts of CO, UHC, and/or carbon present in the particulate matter or ash increase, then the combustion process is not being completed and a potential heat source is being lost to the bottom ash hopper and to the precipitators.

There should be no increase in slagging with the use of the low-NO_x firing system for this would lead to an increase in the use of soot blowers, and a decrease in availability dictated by a boiler turndown in the event that load dropping became necessary as a slag shedding procedure. Increasing soot blowing activity requires an increase in chemically treated boiler make-up water, thus increasing production costs. Increased accumulation of slag on the waterwalls could also have a detrimental effect on the heat transfer rate to the waterwalls. This increase of slag results in decreased lower furnace heat transfer due to the insulating effect of the slag, thus the gas temperature entering the convective heat transfer section of the unit increases thereby raising the final superheat and reheat temperatures. This condition requires the use of more desuperheat spray to be used as a temperature controlling mechanism causing cycle efficiency losses. Also, if the gas temperature is greater than the fusion temperature of the ash constituents of the coal being burned, an increase in fouling and plugging in the convective section can occur. Normal boiler operating practice in situations such as this requires a reduction of boiler load to shed slag, thus increasing the operating costs of the unit.

The percentage of excess air used should not be increased because NO_x emissions would increase (this result is shown in Figure 6). This also would increase the sensible heat loss in the flue gas exiting the furnace and would result in lower boiler efficiencies. An increase in the amount of excess air used will also increase the gas velocities in the superheater, reheater, economizer, and air preheater sections of the boiler which could cause erosion due to the presence of flyash. Increasing the percentage of excess air can produce flame instability which will decrease the turndown capability of the boiler unit. This will result in the use of higher priced auxiliary fuels during low boiler load operating conditions to provide ignition stability. Increased excess air also requires more forced draft (FD) and induced draft (ID) fan power.

The primary air/coal velocities should not be decreased as this could cause an increase in coal drop-out in the primary air/fuel feed pipes. This decrease in velocity will bring the ignition point closer to the coal injector which is good for NO_x reduction, however, it could also cause increased coking and coal nozzle deterioration.

The low-NO_x firing system modification to the windbox should not have a detrimental effect on flame stability in general and at low loads in particular as this will decrease system availability.

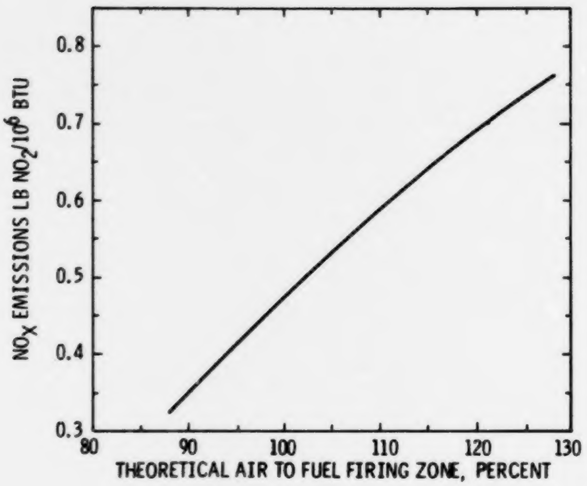
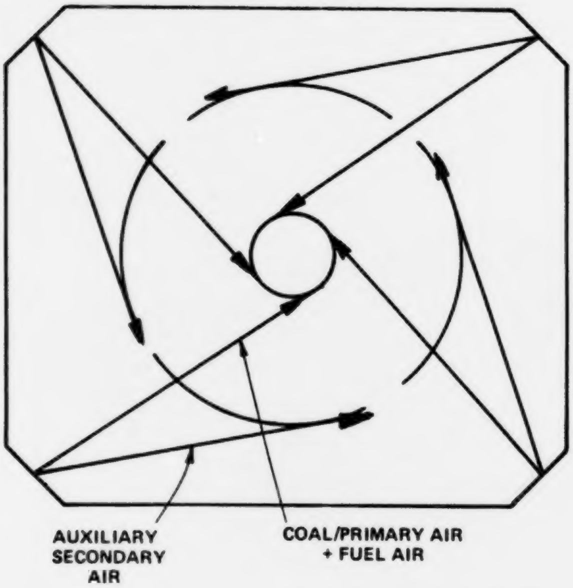


Figure 6. Decreasing theoretical air to fuel firing zone decreases NO_x emissions.



AUXILIARY SECONDARY AIR
COAL/PRIMARY AIR + FUEL AIR

Figure 7. Principle of offset firing with LNCFS.

The system should be designed in such a way so that "hotspots" do not occur on the waterwall (due to flame impingement) as this may cause running slag. Hotspots may also cause tube failures due to a departure from nucleate boiling.

Any modifications to the system should also take into account the capacity of the forced draft fan. The low-NO_x firing system should not induce a pressure drop which the FD fan cannot accommodate as this will effect unit availability or it would necessitate a capital expenditure and an increase in operating costs to handle the increased pressure drop (higher motor horsepower).

The design of the low-NO_x firing system should be such that during boiler operation the flame front is close enough to the coal nozzle so that a correct interpretation of flame presence by the flame scanner is possible.

Any modifications to the windbox to implement the low-NO_x firing system should not have any adverse effects upon the burner tilt mechanism.

Any modifications that are required to implement the low-NO_x firing system should be sound in structure, should fit into the required confines of the windbox, and should not have any extraneous hardware exposed to the furnace environs.

The low-NO_x firing system should be designed in such a fashion as to restrain the mixing between the primary air/coal and the secondary air. This design is desirable because it reduces the amount of NO_x formed via two mechanisms. First, by having a fuel-rich/air-lean atmosphere during the coal firing process, the initial amount of NO_x formed is reduced because less oxygen is available to combine with fuel nitrogen. Second, because of the reduced air concentrations during the initial stages of the firing process, primary stage residence time increases. This increased residence period provides an environment which is desirable for the reduction of any oxidizable nitrogen intermediates that have been formed (such as NH_3 of HCN). This is done by entraining and reducing NO_x compounds and their intermediates into their elemental components, oxygen and nitrogen, and, combusting the hydrocarbons.

The boiler modification should differentiate the fuel-rich and air-rich sections of the boiler and for each burner level of each windbox. The ignition front of each fuel nozzle should be fuel-rich so that the fuel nitrogen can be driven off from the parent fuel and reduced to molecular nitrogen and oxidizable nitrogen intermediates. The latter stages of the combustion process should be air-rich to assure complete combustion and to preferentially react the nitrogen intermediates formed during the first stages of combustion with the excess oxygen and the NO_x formed during char combustion. This will further reduce the flue gas NO_x emissions level.

Low-NO_x Concentric Firing System (LNCFS)

The low-NO_x concentric firing system was developed for applications in tangentially fired steam generators. The system is designed to limit NO_x emissions by aerodynamically controlling the mixing of the fuel and the combustion air. The aerodynamic control is achieved by directing the auxiliary air (so called because it flows through the auxiliary compartments located between successive fuel elevations in a windbox - see Figure 2 for a typical windbox arrangement) towards an imaginary circle that has a larger radius than the firing circle which is typical of tangential firing (see Figure 7). With this type of configuration the flame front is stabilized and the initial devolatilization period occurs with a fuel-rich atmosphere. Also, during the design of this system it was felt that the decrease in the fuel and air jet momentum directed towards the firing circle would allow the flame front to be stabilized at a point closer to the burner. This would further lengthen the fuel-rich zone during which fuel-bound nitrogen could evolve and be reduced to N2. However, as will be discussed later, in the full scale demonstration tests this was not seen simply with the horizontally offset firing design. A closer stabilized flame front was observed in the second generation of the LNCFS which included flame holders (or flame diffusers as they are sometimes called) on the coal nozzle tips.

The velocity of the secondary air (secondary air is composed of the auxiliary air, fuel compartment air that flows around the fuel pipe and nozzle tip, and overfire air) was increased in the design of the LNCFS to prevent the premature reentrainment of the offset auxiliary air with the primary air, fuel and fuel air jet.

The remainder of secondary air, that which is not used to stabilize the flame front (fuel-air), and that which is not directed towards the waterwalls in the offset firing mode (auxiliary air), is injected into the furnace proper through the overfire air compartments. This completes the staging process and assures a high carbon conversion rate.

For the utility demonstration at the Hunter No. 2 Unit of Utah Power & Light Co. the low-NO_x modification consisted solely of windbox components. In particular, the coal and auxiliary compartments (Figures 8 and 9) were retrofitted with the Low-NO_x Concentric Firing System. The three main auxiliary compartments elevations and the two half-size end auxiliary compartments were modified to accept horizontally adjustable offset air nozzle tips (Figure 10). The coal compartments were modified by reducing the free area available through which fuel air could pass (Figure 11). This forces more air through the offset auxiliary compartments and the two unmodified overfire air compartments. This was done by removing the two fuel air nozzle tips located in each coal compartment and blocking off a majority of the free area. The remainder of the fuel area was incorporated into a single slightly larger coal nozzle tip. The bluff body created by the blocking off of this free area enhances recirculation of the fuel-rich primary airstream and thus helps to create a close stable flame front.

Following the March 1982 series of post-modification testing it was decided that a further optimization of the LNCFS was necessary to stabilize the flame front even closer to the coal nozzle tip than was possible with the bluff body created with the original LNCFS design. This goal was accomplished by directing the fuel air away from the primary air and fuel jet with a divergent coal nozzle tip (flame holder). See Figure 12.

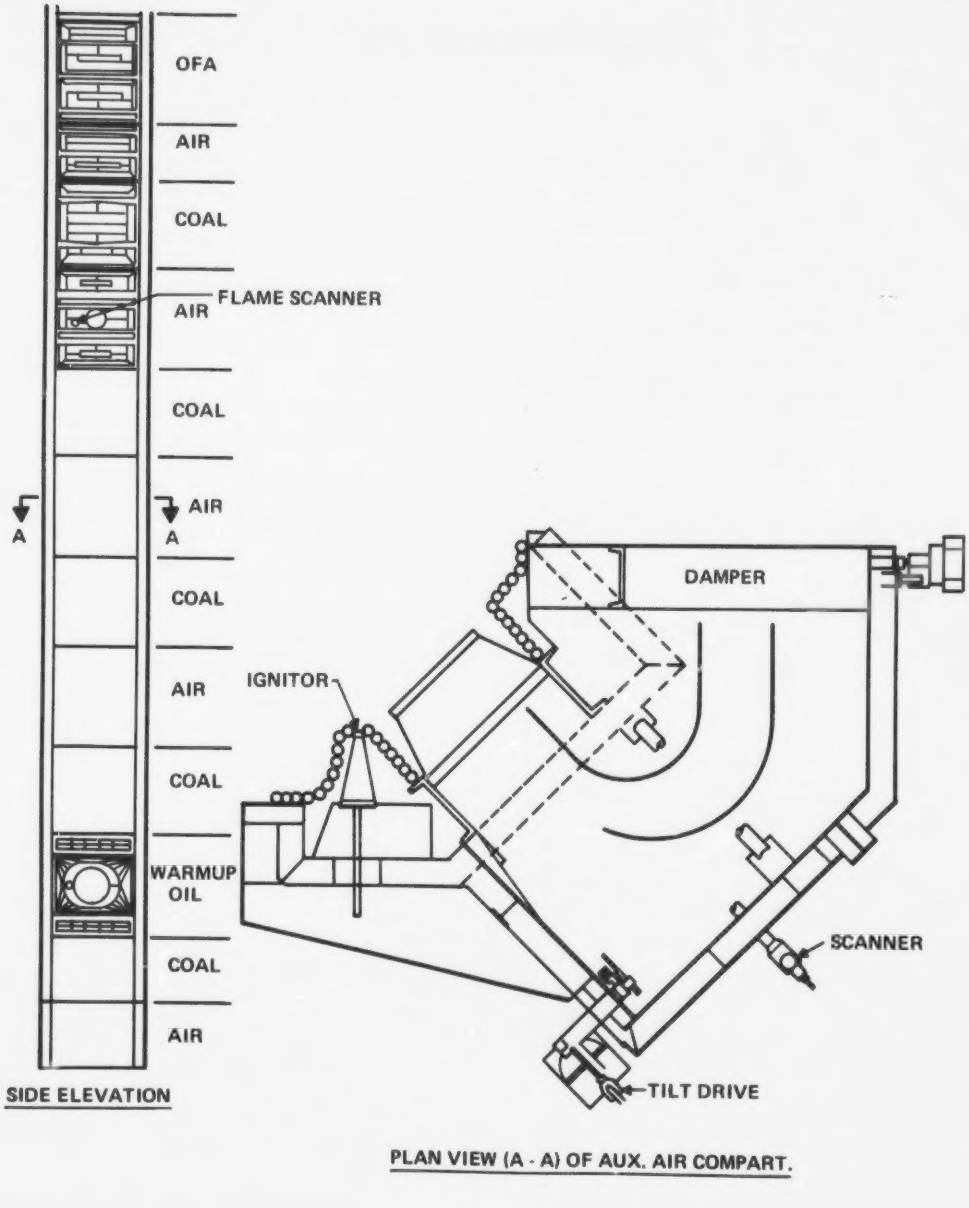
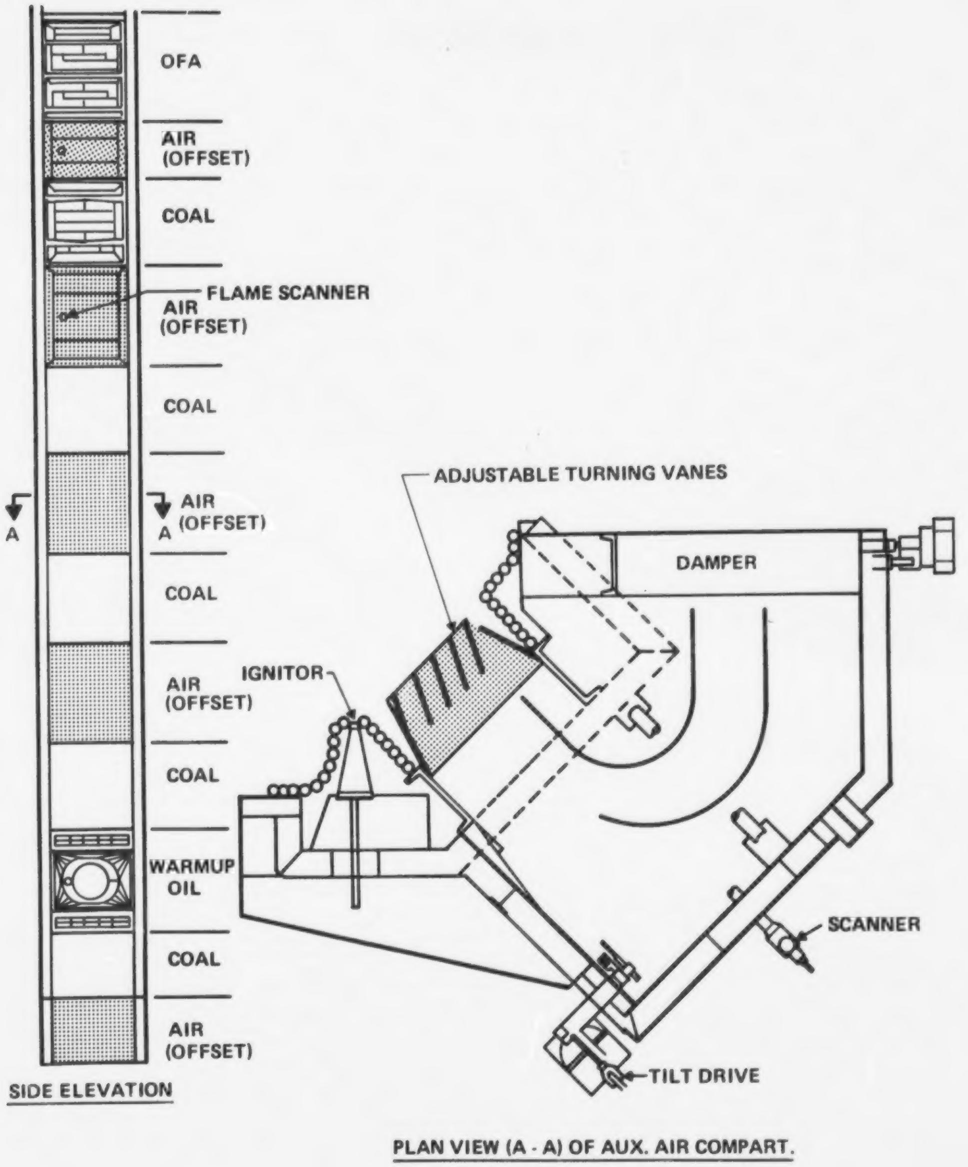

OFA
AIR
COAL
AIR
FLAME SCANNER
COAL
AIR
A
A
COAL
AIR
COAL
WARMUP OIL
COAL
AIR
SIDE ELEVATION
DAMPER
IGNITOR
SCANNER
TILT DRIVE
PLAN VIEW (A - A) OF AUX. AIR COMPART.

Figure 8. Original windbox at Hunter No. 2.


OFA
AIR (OFFSET)
COAL
FLAME SCANNER
AIR (OFFSET)
COAL
A
A
AIR (OFFSET)
COAL
AIR (OFFSET)
COAL
WARMUP OIL
COAL
AIR (OFFSET)
ADJUSTABLE TURNING VANES
DAMPER
IGNITOR
SCANNER
TILT DRIVE

SIDE ELEVATION

PLAN VIEW (A - A) OF AUX. AIR COMPART.

Figure 9. Low-NO_x Concentric Firing System (LNCFS) windbox modification arrangement at Hunter No. 2.

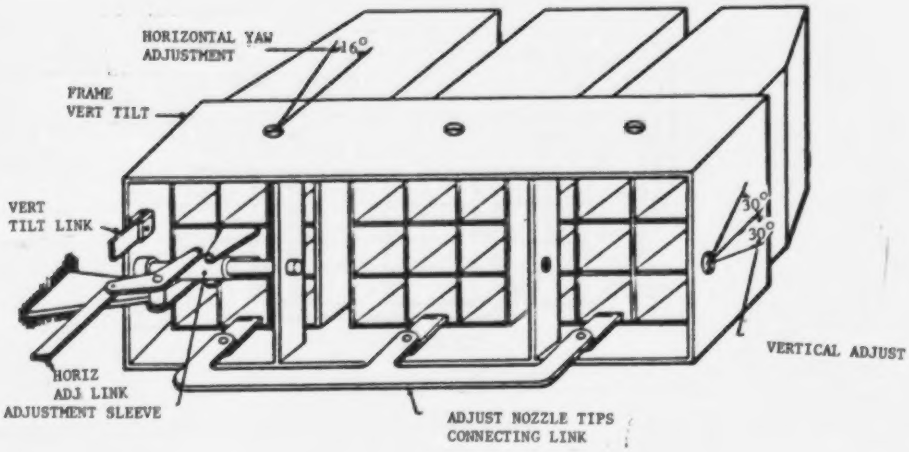

HORIZONTAL YAW ADJUSTMENT
16°
FRAME VERT TILT
VERT TILT LINK
30°
30°
VERTICAL ADJUST
HORIZ ADJ LINK
ADJUSTMENT SLEEVE
ADJUST NOZZLE TIPS CONNECTING LINK

Figure 10. Typical arrangement for horizontally and vertically adjustable air nozzle tip.

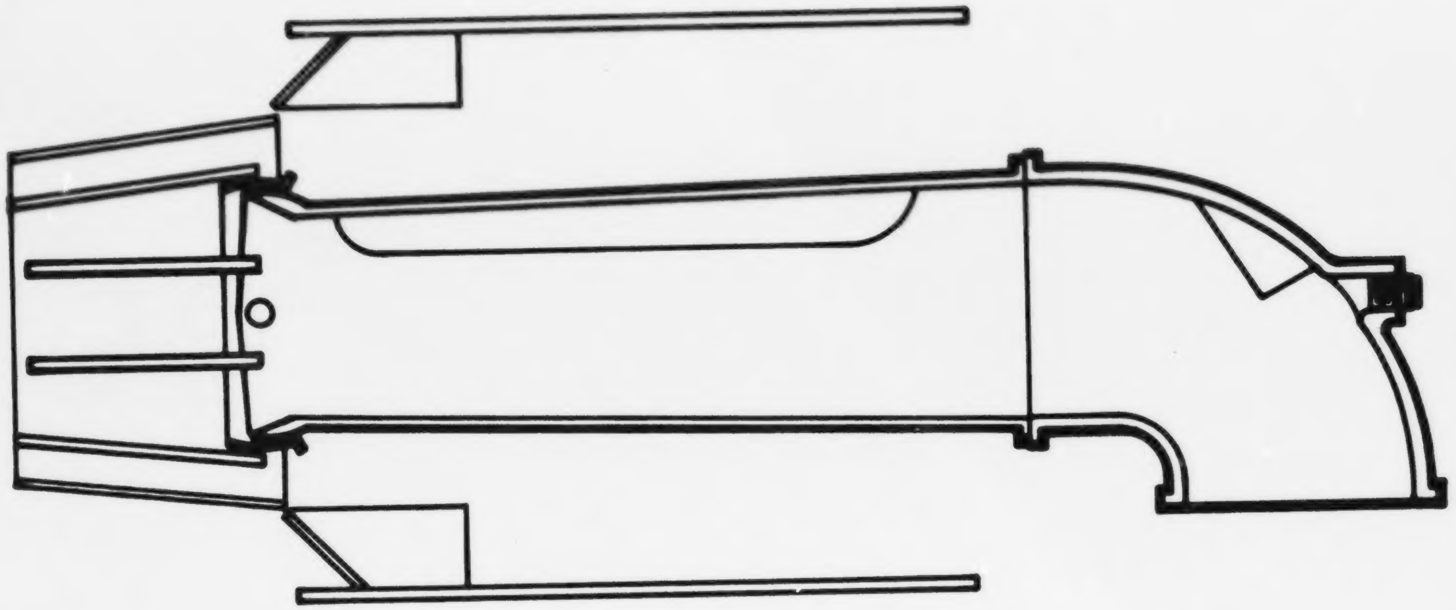


Figure 11. Coal nozzle and tip with fuel air blocking plates for LNCFS at Hunter No. 2.

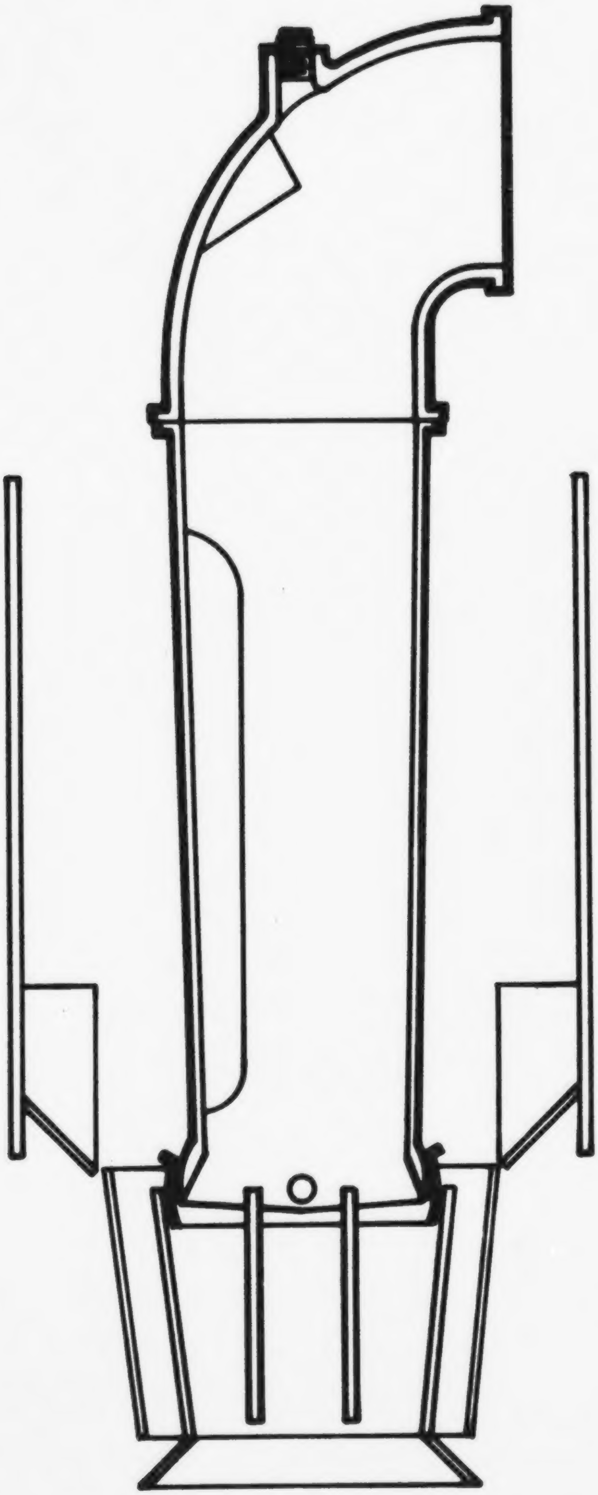


Figure 12. LNCFS coal nozzle tip with flame holders (diffusers).

The unit was further modified in January 1984. The purpose of this modification was two fold. First, the characterization testing had determined that the lowest NO_x emission levels were achieved when the LNCFS was used in conjunction with overfire air. This required the windbox free areas to be modified such that overfire air was an integral part of the windbox rather than simply an extension. And second, operational problems (discussed in results section) had tentatively shown that the original configuration of the LNCFS had removed too much fuel compartment free area (fuel air). This was corrected by decreasing the size of the blocking plates discussed above (see Figures 13 and 14). Table 1 shows the relative compartmental free areas for each of the windbox modifications.

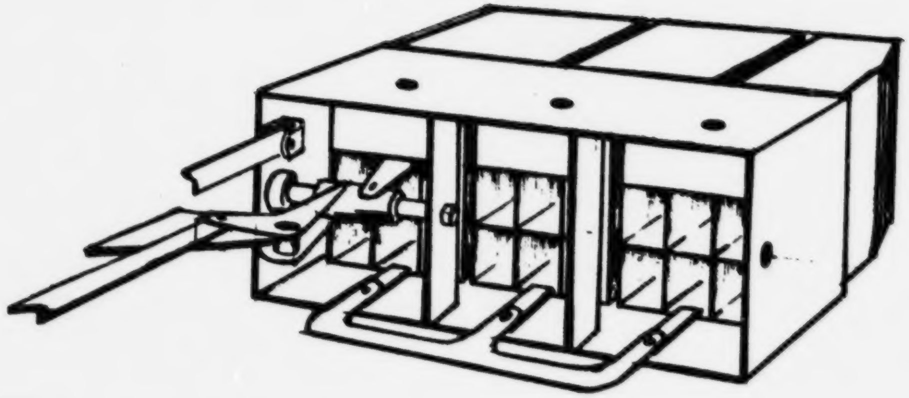


Figure 13. LNCFS horizontal and vertical tilting air nozzle tip showing location of blocking plates installed February, 1984.

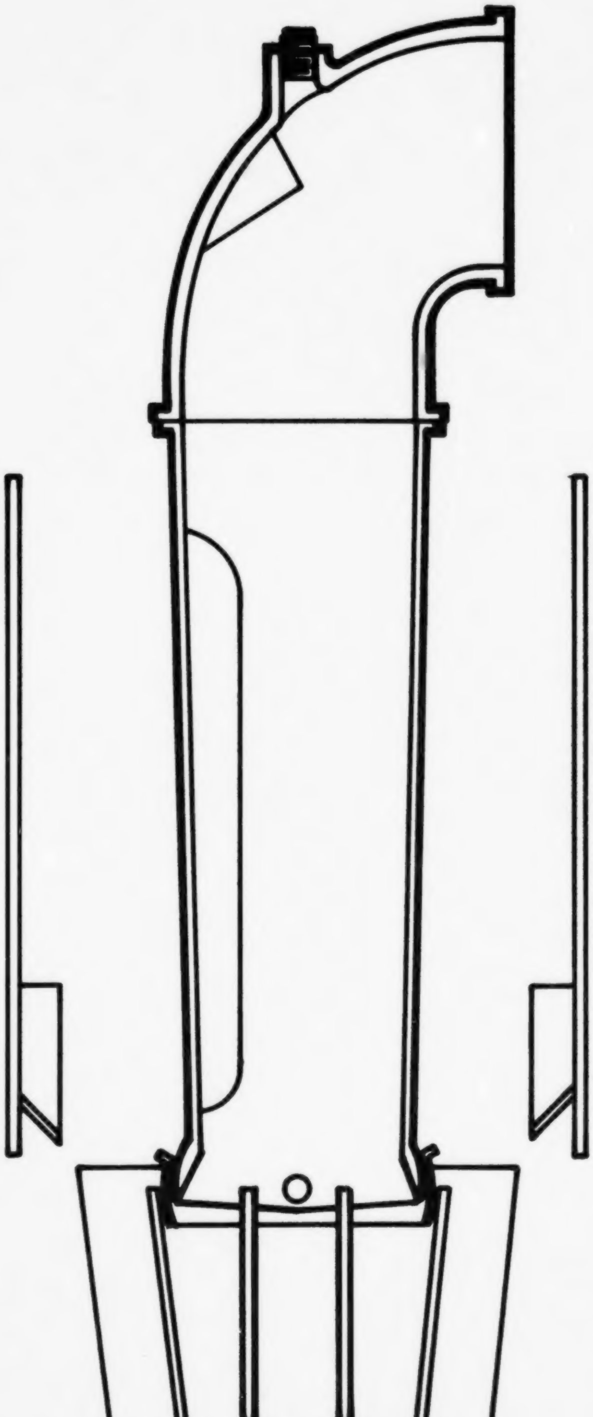


Figure 14. LNCFS coal nozzle tip with flame diffusers and decreased fuel air blocking plates.

TABLE 1. WINDBOX COMPARTMENT FREE AREA COMPARISON
LOW-NO2 CONCENTRIC FIRING SYSTEM: UTAH POWER AND
LIGHT CO. - HUNTER UNIT 2

Compartment Designation	Compartment Height (in.)	Compartment Free Area (% of Total) Design (D)*	LNCFS (L)*	Partially Restored (P)
Overfire Air-2	21.25	6.95%	9.25%	7.68%
Overfire Air-1	21.25	6.95%	9.25%	7.68%
Auxiliary 0-1	19.25	6.11%	7.82%	5.76%
Coal 1-1	34.00	6.82%	4.97%	6.21%
Auxiliary 1-2	39.25	14.79%	15.70%	10.59%
Coal 2-2	34.00	6.82%	4.97%	6.21%
Auxiliary 2-3	39.25	14.79%	15.70%	10.59%
Coal 3-3	34.00	6.82%	4.97%	6.21%
Auxiliary 3-4	39.25	14.79%	15.70%	10.59%
Coal 4-4	34.00	6.82%	4.97%	6.21%
Oil/Auxiliary 4-5	39.25	9.31%	12.41%	10.30%
Coal 5-5	34.00	6.82%	4.97%	6.21%
Auxiliary 5-5	19.25	6.11%	7.82%	5.76%
	Total Free Area	Area (D)	Area (L)	Area (P)

Area (L) = 0.75 Area (D);
Area (P) = 0.90 Area (D)

*Area percentages for the Design and LNCFS cases total to greater than 100 percent because OFA was not considered integral to windbox operation for these cases. Therefore, Area (D) and Area (L) do not have the OFA free areas weighted in and Area (P) does.

V. NOMENCLATURE

The following terms, abbreviations and symbols have been used in one or more sections of the report or appendices.

Term	Definition
NO_x	Oxides of Nitrogen
UHC	Unburned Hydrocarbons
Burner Tilt (BTilt)	Vertical tilting of burner tips in furnace
Overfire Air Tilt (OFAT)	Vertical tilting of overfire air compartments
Offset	Horizontal tilting of auxiliary air compartments away from fuel compartments
Fuel Air	Fuel compartment secondary air
Fuel Air Dampers (FAD)	Fuel compartments secondary air controller
Auxiliary Compartments (AUX)	Secondary air compartment located between fuel compartments
LNCFS	Low NO_x Concentric Firing System
Windbox (WB)	Secondary air plenum in each furnace corner
WB/Furnace Delta P	Air pressure differential between windbox and furnace
CO	Carbon Monoxide
O_2	Oxygen
Excess Air	Amount of air supplied over stoichiometric requirements - expressed either as percent excess flue gas oxygen or percent of stoichiometry. In Appendix A: L = low, N = normal, H = high.

The front wall is on the turbine side of the furnace and the left, right, and rear sides are located by facing the front side.

Fuel elevations are designated from the top to the bottom starting at A or 1 and through E or 5. The overfire air compartments are labeled sequentially OFA-1 and OFA-2 with OFA-2 on top.

The firing circle is an imaginary circle in the furnace tangent to which the burners are aimed. For this boiler the firing angle, and thus the firing circle radius, is 4° off the furnace diagonal. The flame swirl imparted by this aiming is counter-clockwise. The offset of the LNCFS is measured in degrees from this firing angle.

PART B

DATA ACQUISITION AND TESTING METHODOLOGY

During the five short-term test series conducted on this unit boiler performance and operating data was primarily obtained from the control room computer system. This included the pressures, flowrates and temperatures of the fuel and combustion air, and the flue gas, water and steam. Many of the principal operating parameters and a few of the data points which were not available on the computer were verified via readings obtained from the unit control boards. This data is presented in Appendix B. For tests during which the plant computer was not in service additional board data was obtained.

To supplement this data, additional gaseous emission, solids, and corrosion data was gathered. This additional data was gathered by Exxon Research and Engineering Company (ER&E) and their methodology is abstracted hereinafter.

I. GASEOUS EMISSIONS

Both flue gas and furnace gas samples were analyzed with extractive monitors during the testing. Flue gas was monitored by extractive Continuous Emissions Monitors (CEM) using the twin economizer outlet/air heater inlet as the sampling location. Furnace gas environment was measured during several specific tests (02 and CO primarily). This was done using 45 gas taps located in the furnace walls. General specifications of the two systems are shown next.

Flue Gas

Figures 15, 16, 17 and 18 show the flue gas sampling locations and the monitoring equipment. The system utilized a twelve-point sampling matrix which equally divided the two economizer outlet ducts. Each set of three cross duct sampling points (total of four sets or probes) was mixed and filtered for water and particulates and then each of the four composite sets

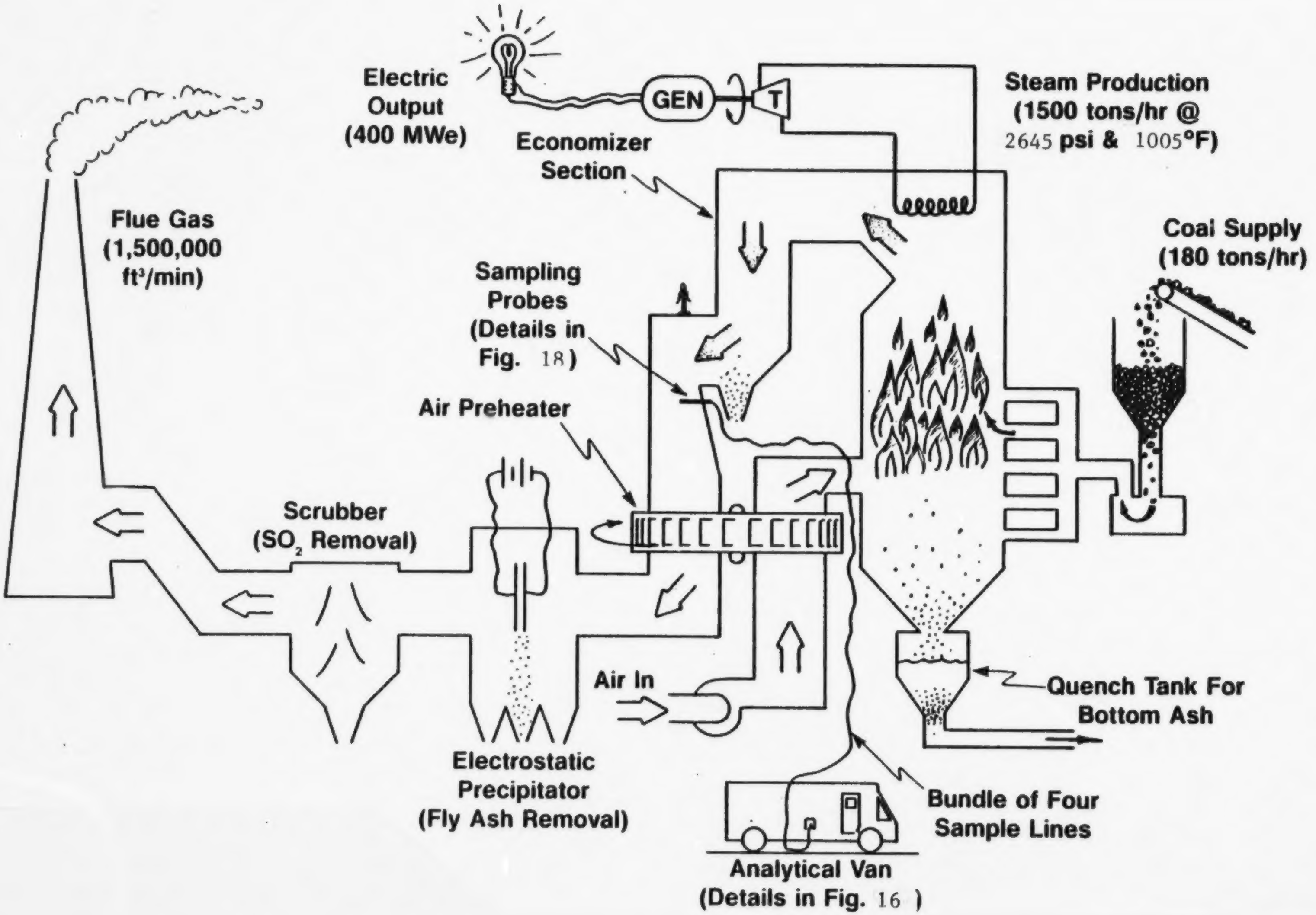

Electric
Output
(400 MWe)
GEN
T
Steam Production
(1500 tons/hr @
2645 psi & 1005°F)
Economizer
Section
Flue Gas
(1,500,000
ft³/min)
Coal Supply
(180 tons/hr)
Sampling
Probes
(Details in
Fig. 18)
Air Preheater
Scrubber
(SO₂ Removal)
Air In
Quench Tank For
Bottom Ash
Electrostatic
Precipitator
(Fly Ash Removal)
Bundle of Four
Sample Lines
Analytical Van
(Details in Fig. 16)

Figure 15. Schematic of process flow at Hunter No. 2 showing flue gas and precipitator sampling locations.

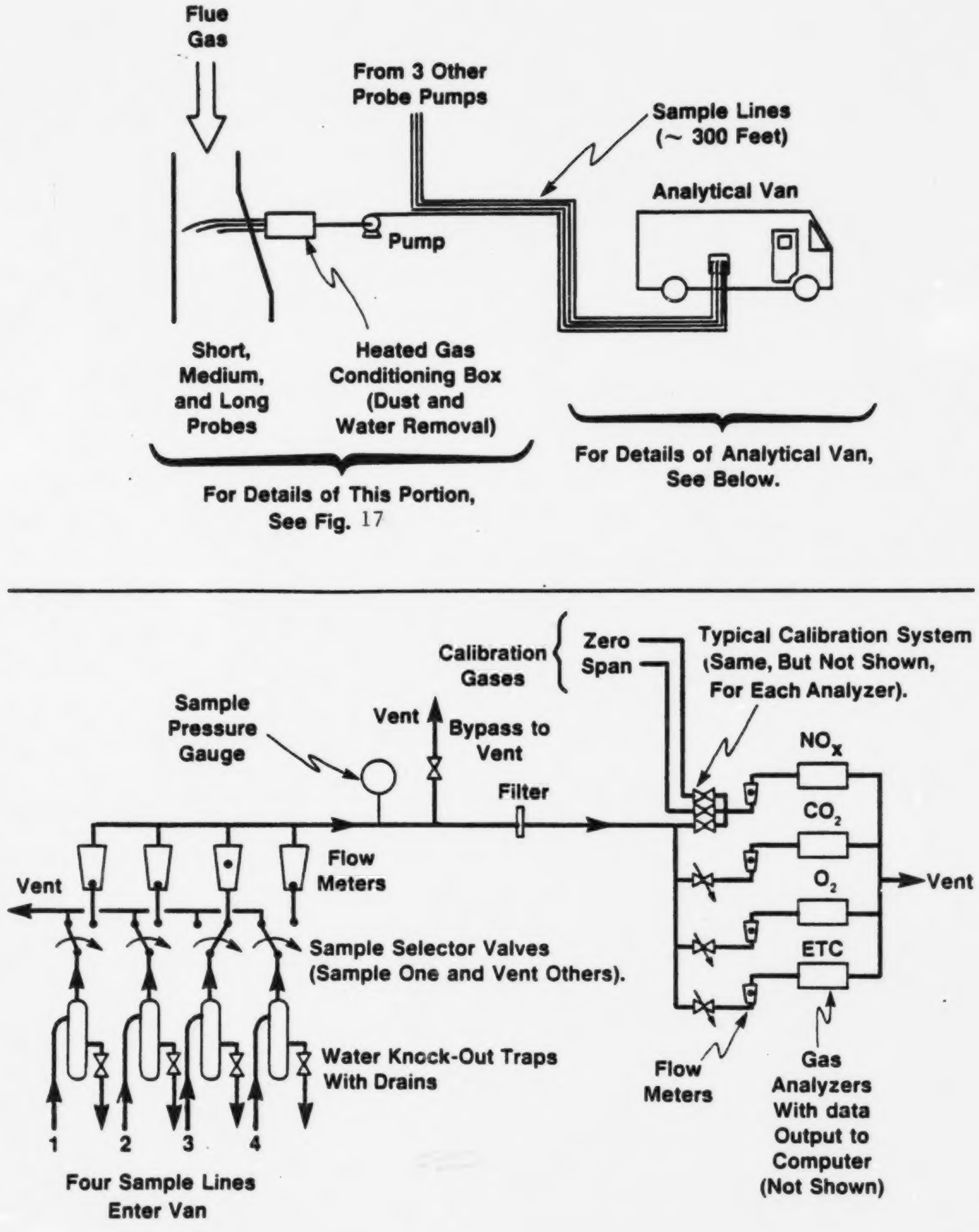

Flue Gas
From 3 Other Probe Pumps
Sample Lines (~ 300 Feet)
Analytical Van
Pump
Short, Medium, and Long Probes
Heated Gas Conditioning Box (Dust and Water Removal)
For Details of This Portion, See Fig. 17
For Details of Analytical Van, See Below.
Calibration Gases
Zero
Span
Typical Calibration System (Same, But Not Shown, For Each Analyzer).
Sample Pressure Gauge
Vent
Bypass to Vent
Filter
NO$_x$
CO$_2$
O$_2$
ETC
Vent
Flow Meters
Vent
Sample Selector Valves (Sample One and Vent Others).
Water Knock-Out Traps With Drains
1
2
3
4
Four Sample Lines Enter Van
Flow Meters
Gas Analyzers With data Output to Computer (Not Shown)

Figure 16. Schematic of gaseous emissions sampling train.

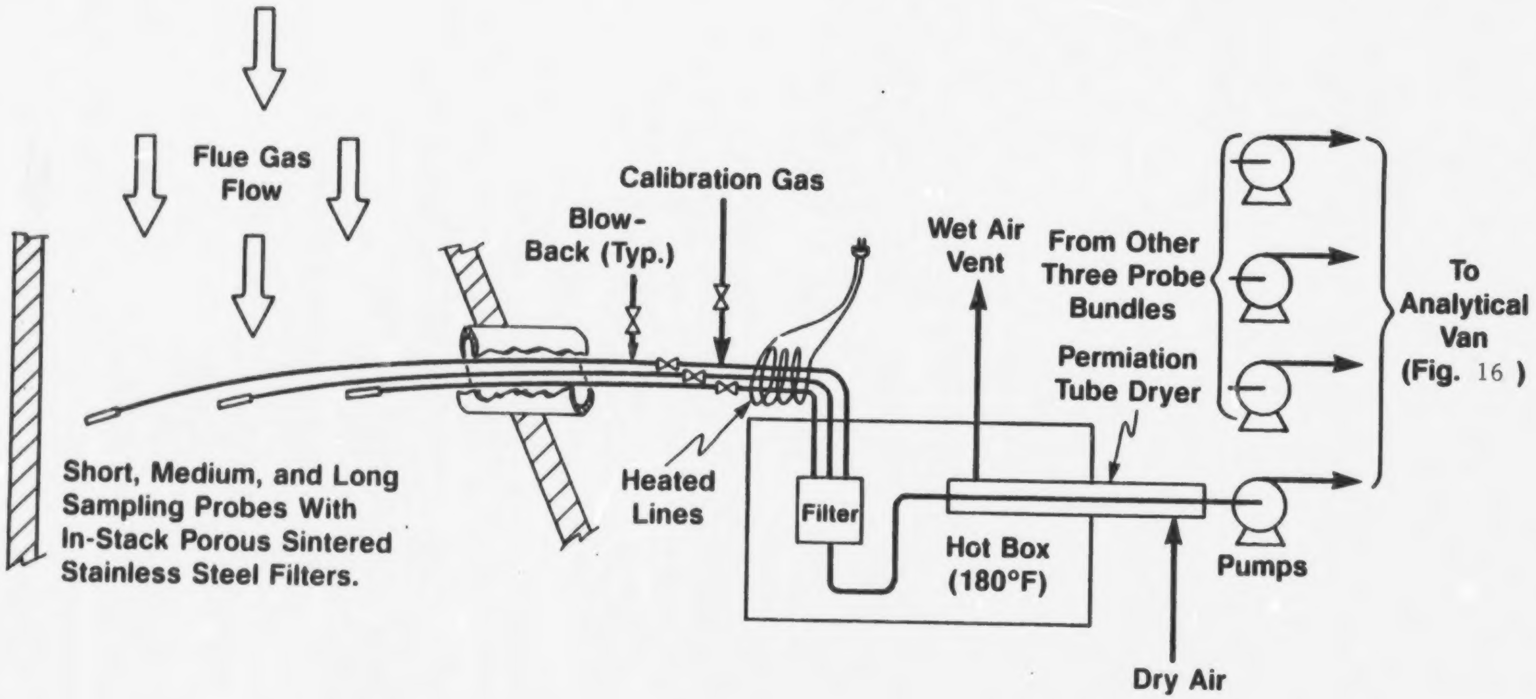
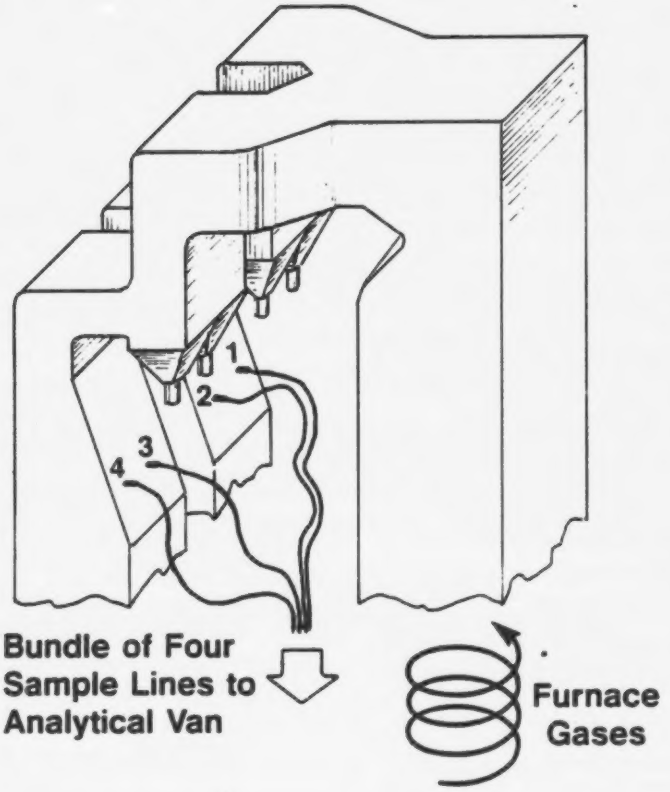

Flue Gas Flow
Calibration Gas
Blow-Back (Typ.)
Wet Air Vent
From Other Three Probe Bundles
Permiation Tube Dryer
To Analytical Van (Fig. 16)
Short, Medium, and Long Sampling Probes With In-Stack Porous Sintered Stainless Steel Filters.
Heated Lines
Filter
Hot Box (180°F)
Pumps
Dry Air

Figure 17. Details of gas sampling probe and sample preparation.


1
2
3
4
Bundle of Four Sample Lines to Analytical Van
Furnace Gases

(Note: Heated Gas Conditioning Boxes and Sample Pumps are Not Shown.)

For Details of Sampling Probes, See Figure 17

Figure 18. Detail of Figure 15 showing economizer outlet gaseous emissions sampling location.

was transported in a teflon line to the analytical equipment. The analytical equipment used for measuring NO, NO_2, O_2, CO, and CO_2 and compositions of standard gas mixtures are presented in Tables 2 and 3, respectively.

To conduct a complete flue gas emissions test approximately 20 minutes of steady-state boiler operation was required. Upon completion of a test a printed copy of the results was produced. This copy also included results corrected to a standard dilution of 3% oxygen (dry).

In addition to monitoring gaseous emissions during a test, the CEM was also utilized to optimize the air flow during the very low excess air tests. This was done by monitoring the CO emissions during the test set-up period. This ability to closely monitor the flue gas during the short-term tests allowed the boiler operators to lower the excess air levels (and thus NO_x levels) below levels achievable with the plants normal monitoring equipment. This result is verified by the lower oxygen and NO_x levels achieved during the short-term tests compared to the thirty-day tests. It should be noted that long term control of excess air by CO monitoring is currently under development.

Furnace Gas Environment

Localized furnace gas environment was monitored for several tests during this program. This was done with 45 waterwall gas taps using 1/4 inch taps placed through the waterwall membrane. Locations of these taps are shown in Figure 19. The purpose of these taps was two-fold. First, to determine if localized furnace gas compositions could be correlated to waterwall slagging and/or waterwall corrosion, if either exists. And second, to assess the effect of concentric firing (LNCFS) and overfire air on near-wall gas composition.

The equipment utilized for analyzing the gas composition on-line was either a MSA Model 1000 semi-continuous detector or a Sun Instruments Model EPA-75 analyzer. The MSA instrument detects 02 and CO concentrations (up to

TABLE 2

MOBILE ANALYTICAL LABORATORY: CONTINUOUS GAS MONITORS AND CALIBRATION STANDARDS

Gas Monitored	Method	Manufacturer	Measurement Ranges	Calibration Standard*
NO/NO_x	chemiluminescent	Thermo Electron	0-2.5 ppm	1 & 2
			0-10 ppm	
			0-25 ppm	
			0-100 ppm	
			0-250 ppm	
			0-1000 ppm	
			0-2500 ppm	
			0-10000 ppm	
O_2	polarographic	Beckman	0-5%	3 & 4
			0-25%	5
CO_2	non-dispersive infrared (NDIR)	Beckman	0-20%	3
CO	non-dispersive infrared (NDIR)	Beckman	0-500 ppm	3
			0-1000 ppm	
			0-2500 ppm	6

*See Table 3 for composition of calibration gas mixtures. In all cases nitrogen (mixture No. 7) was used for the "zero" check.

TABLE 3

COMPOSITION OF STANDARD GAS MIXTURES USED FOR CALIBRATION OF GAS ANALYZERS
(THIS TABLE FOR USE WITH TABLE)

MIXTURE NUMBER	COMPONENTS	CONCENTRATIONS*
1	NO	477 PPM
2	NO NO_2	477 PPM 37 PPM
3	CO CO_2 CH_4 H_2 O_2 H_2O	150 PPM 13% 25 PPM 1% 4-5% Dry
4	O_2	4%, 4.8%
5	Compressed Air	100%
6	CO	165, 275, 779, 1,400 and 15,000 PPM
7	N_2	100%

*Nitrogen makes up the balance of all mixes.

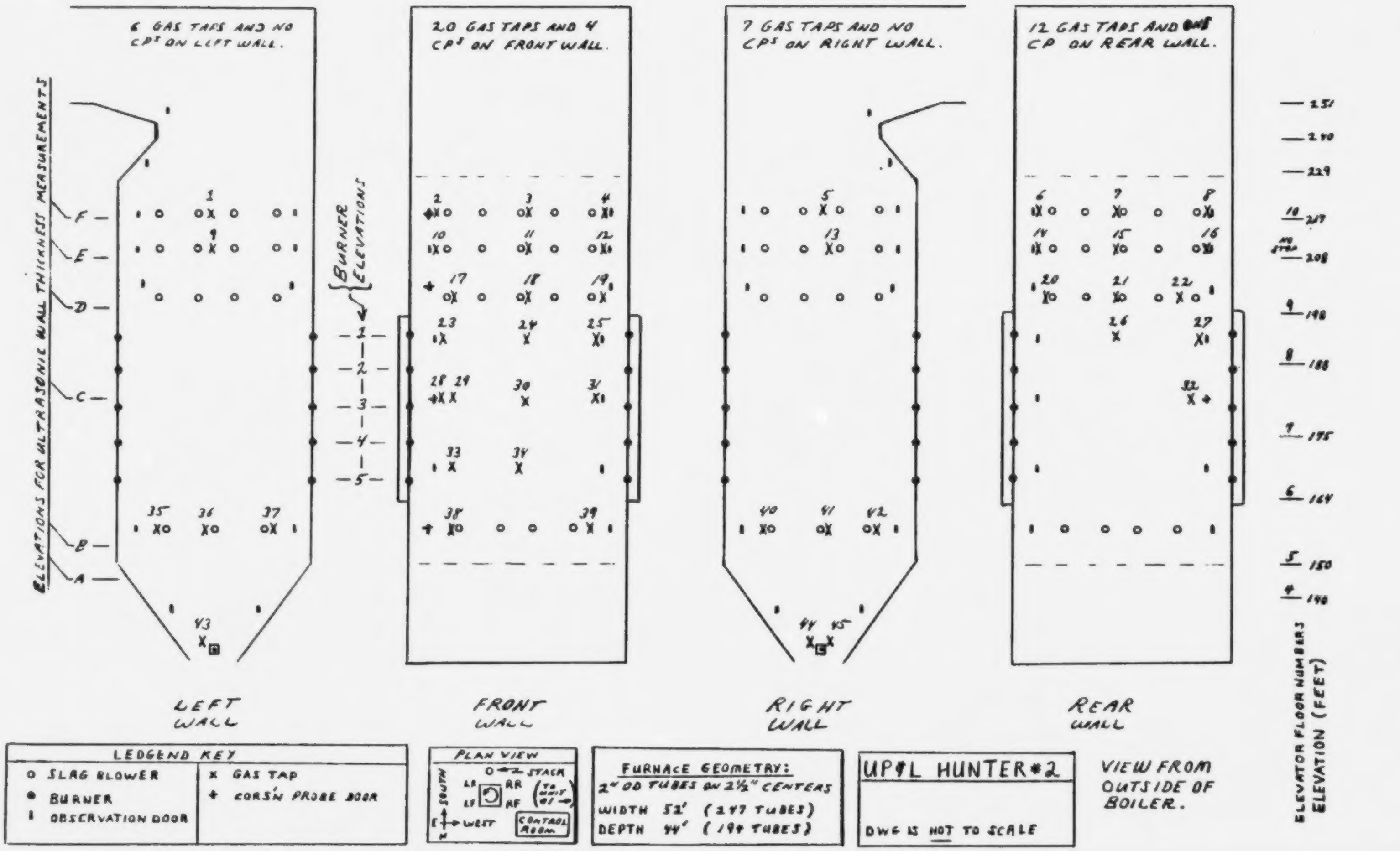

6 GAS TAPS AND NO CPs ON LEFT WALL.
20 GAS TAPS AND 4 CPs ON FRONT WALL.
7 GAS TAPS AND NO CPs ON RIGHT WALL.
12 GAS TAPS AND ONE CP ON REAR WALL.
ELEVATIONS FOR ULTRASONIC WALL THICKNESS MEASUREMENTS
F
E
D
C
B
A
BURNER ELEVATIONS
1
2
3
4
5
LEFT WALL
FRONT WALL
RIGHT WALL
REAR WALL
251
240
229
10 217
208
9 198
8 188
7 175
6 164
5 150
4 140
ELEVATOR FLOOR NUMBERS
ELEVATION (FEET)
LEDGEND KEY
o SLAG BLOWER
● BURNER
I OBSERVATION DOOR
x GAS TAP
+ CORS'N PROBE DOOR
PLAN VIEW
STACK
SOUTH
WEST
CONTROL ROOM
FURNACE GEOMETRY:
2" OD TUBES ON 2½" CENTERS
WIDTH 52' (247 TUBES)
DEPTH 44' (194 TUBES)
UP&L HUNTER #2
DWG IS NOT TO SCALE
VIEW FROM OUTSIDE OF BOILER.

Figure 19. Sketch of boiler layout showing locations of gas taps; corrosion probes, and ultrasonic thickness measurement elevations.

2000 ppm CO) using electrolytic membrance and electrochemical polarigraphic methods, respectively. The Sun instrument determines CO levels (up to 20,000 ppm CO) by a non-dispersive infrared (NDIR) technique.

A complete gas tap test required approximately six hours of steady boiler operation. That is, steady load, burner tilts and curtailment of sootblower operation. Also, typically, flue gas test were run several times during a gas trip test and solids samples (coal and flyash) were also taken.

II. SOLID SPECIES

Part of this program entailed evaluation of low NO_x firing conditions on boiler and auxiliary equipment performance. This included determining boiler efficiencies and electrostatic precipitator performance changes that might have occurred due to low NO_x operations.

To determine boiler efficiency by ASME's Heat Loss Method Coal and Flyash samples were taken. Bottom ash was not taken during this program because previous test results on other units had shown that heat losses due to combustables in the bottom ash were either very minor or negligible at all.

To assure that representative coal and flyash samples were taken during a test; the coal samples were taken from the pulverizer feeders and the flyash was taken from hoppers which were being continuously dumped. Complete coal analyses and carbon-in-flyash analyses were conducted on these samples in C-E's laboratories.

The precipitators (ESP) performance was analyzed by conducting an EPA Method 17 test. (See Figure 20). This determined the inlet and outlet grain loading in the flue gas and the size distribution of those particles at the ESP inlet. During the two day test isokinetic sampling traverses were used to insure of representative sampling. Also, gas flow rate, composition, moisture content, temperature, etc. were measured during each test to determine the gas volumetric flow rate and thus the total particulate flow. The particle size distribution analysis was accomplished using an Andersen^{TM}, size selective impacter.

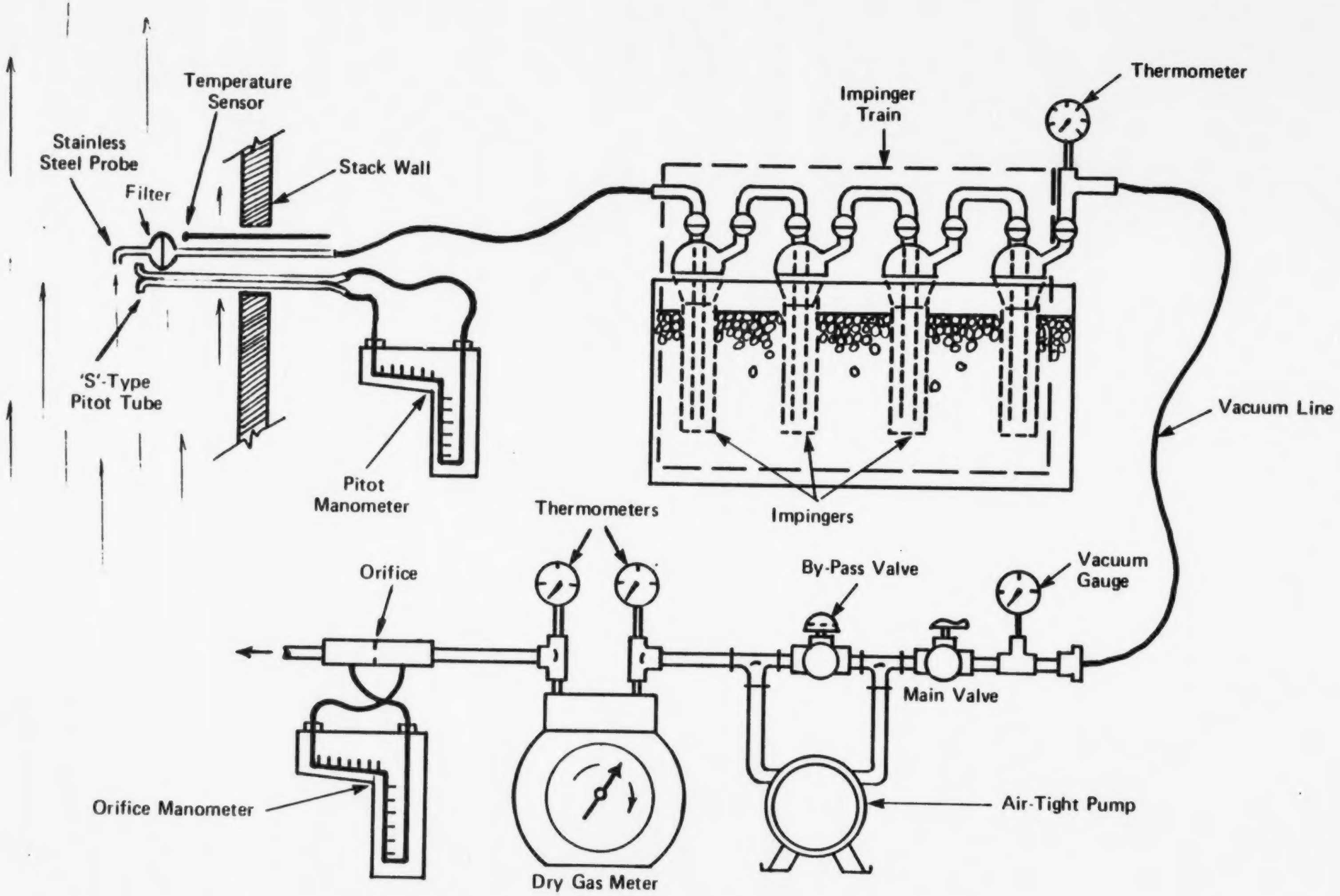

Temperature Sensor
Stainless Steel Probe
Filter
Stack Wall
'S'-Type Pitot Tube
Pitot Manometer
Impinger Train
Thermometer
Vacuum Line
Impingers
Thermometers
Orifice
By-Pass Valve
Vacuum Gauge
Main Valve
Orifice Manometer
Air-Tight Pump
Dry Gas Meter

Figure 20. Schematic of EPA Method 17 sampling system for particulate matter.

III. CORROSION MONITORING

Fireside waterwall corrosion monitoring was accomplished utilizing two methods, corrosion probes and ultrasonic wall thickness measurements. The corrosion probe method utilized temperature controlled wall material tube inserts and various exposure periods. The ultrasonic method measured wall thickness at hundreds of points throughout the furnace at both the beginning and end of the program and compared the results.

Corrosion Probe Method

Each probe consisted of five test rings of various materials and/or material coatings. The probes, as shown in Figure 21, were placed in the furnace walls through door locations shown in Figure 22, for periods of either 30,300 or 1000 hours. For the test at the Hunter No. 2 unit five probe assemblies were used for each test period.

Upon completion of a test period the probes were shipped to C-E for metallurgical analysis (C-E also designed and built the probes). This analysis included weight loss analysis and micrometer measurements of coupon wall thicknesses. This was converted to a corrosion rate (mils per year) by factoring in the material density and the exposure period.

This method is attractive for corrosion analysis because it does not require boiler downtime or furnace entry. However, it is an indirect method and thus intrinsically assumes similar corrosion rates between the probes and the actual walls. This assumption is valid only for extended probe exposure periods. Thus, for this program the value of the corrosion probe analysis method pertained more to a material analysis of the probes test rings. Note, however, that the corrosion probe results will be more conservative (i.e., higher) than the actual corrosion loss and therefore have qualitative value. The next method, ultrasonic waterwall tube thickness measurement is a direct method and due to the extended test period yields quantitative waterwall tube wastage rates.

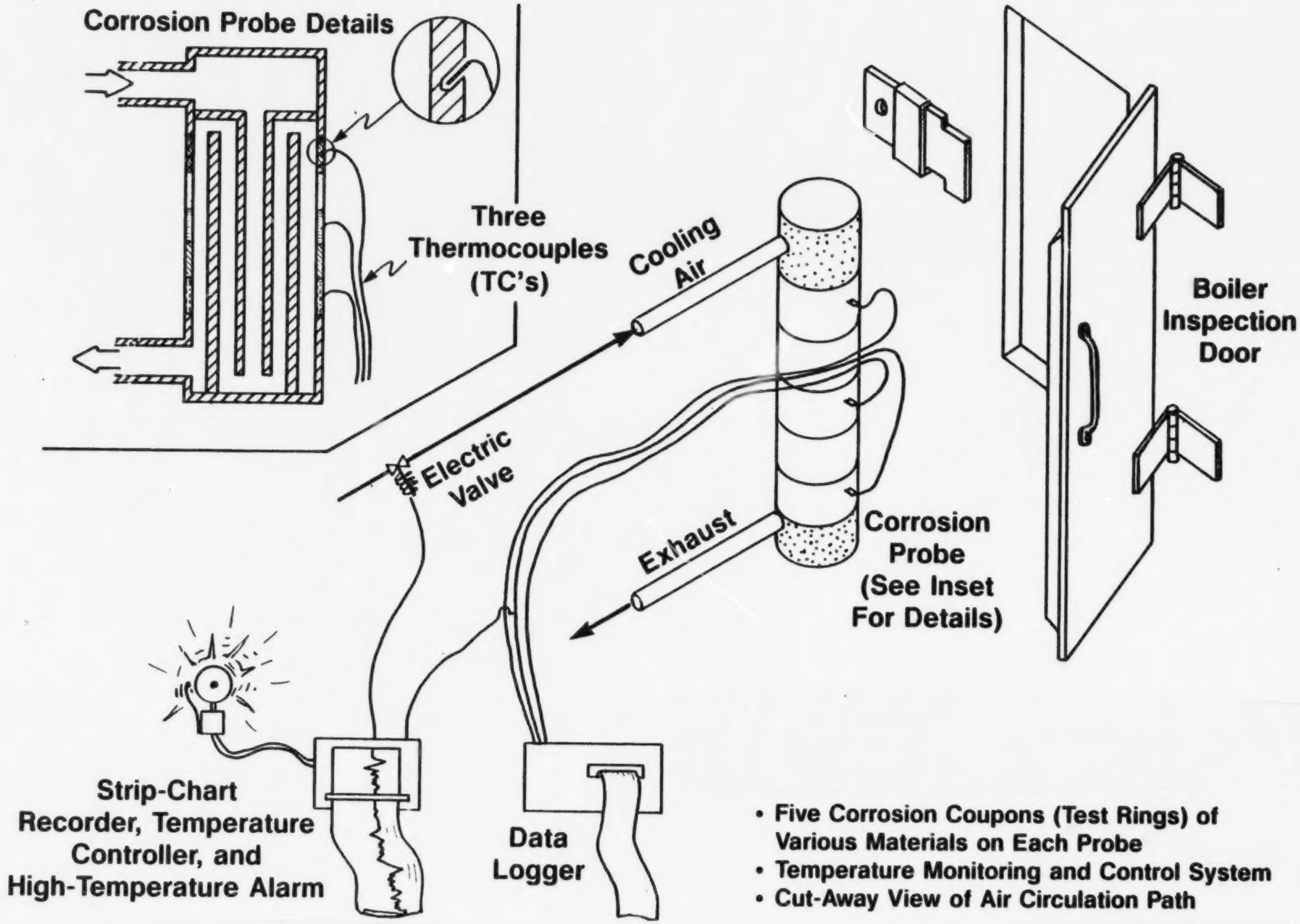
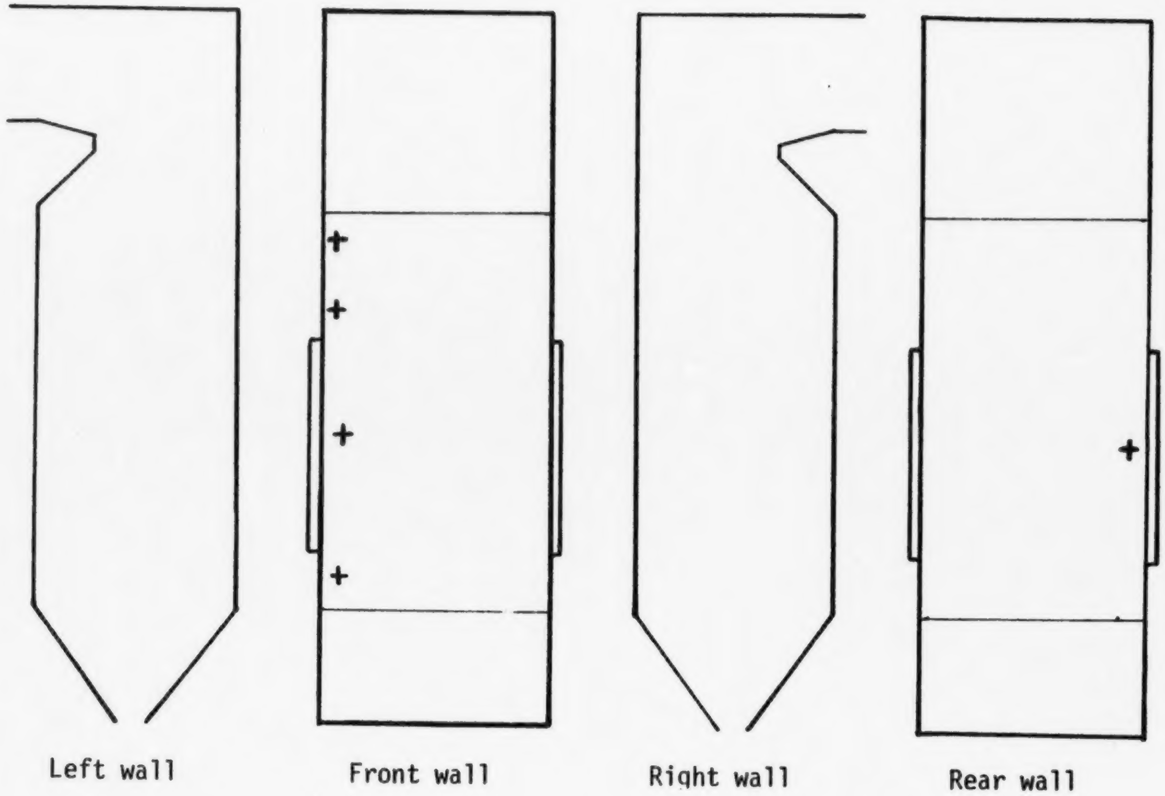

Corrosion Probe Details
Three Thermocouples (TC's)
Cooling Air
Electric Valve
Exhaust
Corrosion Probe (See Inset For Details)
Boiler Inspection Door
Strip-Chart Recorder, Temperature Controller, and High-Temperature Alarm
Data Logger
• Five Corrosion Coupons (Test Rings) of Various Materials on Each Probe
• Temperature Monitoring and Control System
• Cut-Away View of Air Circulation Path

Figure 21. Schematic of furnace waterwall corrosion probe assembly.


+
Left wall
Front wall
Right wall
Rear wall

Key: '+' corrosion probe door (five in all)

Figure 22. Simplified sketch of corrosion probe door locations.

Ultrasonic Method of Tube Thickness Mapping

In the ultrasonic thickness (UT) method, the wall thickness of the fireside furnace wall tubes were determined by echo soundings. A Krautkramer-Branson Model CL-204 UT gauge was used.

This is a direct thickness measurement technique and requires access to the four inside walls of the furnace. For this program nearly 1,000 points were measured. This included six elevations on all four walls. Furnace wall sections which typically have greater amounts of slagging and/or are proximate to the burner flames had a greater concentration of measurement points. The six elevations analyzed are shown in Figure 19.

The two sets of measurements that were compared to ascertain the corrosion rate were taken during scheduled maintenance outages. The first set of measurements took place in September, 1981, and the second, and final, set of measurements were taken in February, 1984. The on-line time period was determined from the utilities files.

For the UT method tube surface preparation is most important. Corrosion or wastage is measured in mils per year, thus, in preparing the surface care had to be taken to remove all surface coatings (slag, paint, mill scale, etc) without removing any of the tube material itself. Additionally, the test plan was designed to factor out biases resulting from the tube cleaning procedures or changes in the corrosion rate due to cleaning the tube.

This method of measuring corrosion or tube wastage rate is more time consuming, difficult and costly than the probe method. However, it also yields a more reliable wastage rate.

PART C

BASELINE CHARACTERIZATION TESTING

I. CHARACTERIZATION TESTING OBJECTIVE

The purpose of conducting characterization tests prior to the low-NO_x modification was to generate a baseline data base on the unit's emissions and performance. This included determining the emissions for normal operating conditions and determining the lowest possible emissions level while still maintaining acceptable boiler operations.

Parameters Evaluated

A total of 64 tests were conducted between August 3 and August 18, 1981. Of these tests, 61 have been used to characterize the NO_x emissions. The variables examined to determine their relation to NO_x emissions included excess air, burner tilt, overfire air flow, overfire air tilt, boiler load, and fuel compartment/auxiliary air compartment air flow distribution. These parameters were examined independently and together where possible.

The normal operating points for the variables listed above which were thought to be significant as part of the NO_x reduction strategy are shown below in Table 4. The range for which each of these parameters was tested is also shown. The extremes of these ranges were determined in the field by closely monitoring the boiler for instability limits or inefficient operation.

TABLE 4. BASELINE CHARACTERIZATION TEST: OPERATING VARIABLES NORMAL OPERATIONS POINT AND TEST RANGE

Parameters	Normal Set Point	Test Range
1. Excess Air (percent oxygen)	4.5%	2.24% to 7.00%
2. Burner Tilt (± degrees from horizontal)	0	+18° to (-20°)
3. Fuel Air Dampers (percent open)	100%	100% to 50%
4. Auxiliary Air Dampers (percent open)	20%	0% to 40%
5. Bottom Auxiliary Dampers (percent open)	50%	0% to 100%
6. Overfire Air Dampers (percent open)	0%	0% to 100%
7. Overfire Air Tilt (± degrees from horizontal)	Not Applicable	+30° to (-10°)
8. Boiler Load	Variable	Full and 75%

II. CHARACTERIZATION RESULTS ANALYSIS

Tables presenting the actual test data for emissions and principal test points are summarized in Appendix A. Boiler operating conditions for all of the tests are shown in Appendix B. This includes all control board and computer data available for the tests.

The NO_x emissions for the standard operating conditions shown in Table 4 were approximately 450 to 460 ppmv (adjusted to 3% 02). Based on the coal analysis and the EPA conversion equation this is equivalent to 0.62 pounds per million Btu fired. From this level, NO_x emissions were reduced by approximately one-third during the baseline testing by fine-tuning the boiler and implementing the already available NO_x reduction methods and processes.

Effect of Excess Oxygen on NO_x

Figure 23 presents the effect of excess oxygen (and hence, excess air) on NO_x emissions. As shown, NO_x is proportional to excess oxygen. At the full load (no overfire air) condition shown, NO_x is reduced approximately 40 to 45 ppmv for each percent decrease in the excess oxygen level. This linear relationship held true over the entire test range of excess oxygens. The lowest excess oxygen level achieved while still maintaining low carbon monoxide levels was approximately 2.3% (equivalent to about 13 percent excess air). Note, however, that this level was achieved while the boiler was being very closely monitored for operational changes. A more prudent excess air level of 18 percent (or 3.0 percent flue gas 02) would allow for greater operational flexibility. The NO_x level at 18 percent excess air was approximately 395 ppmv (0.54 pounds per million Btu).

Effect of Overfire Air on NO_x

Figure 24 shows the same relationship of NO_x emissions versus excess oxygen, however, for these data points the additional effect of overfire air (OFA) is shown. The function previously shown in Figure 23 is replotted here to compare the two relationships. From this figure it can be seen that NO_x decreases by between 75 ppmv and 100 ppmv when overfire air is added. The higher NO_x reduction for OFA at lower excess airs is due to the boiler control logic. That is, the overfire air dampers are manually controlled and the auxiliary compartment dampers are automatic. Therefore, as the excess air level decreases, the auxiliary compartment dampers automatically close. This forces a greater percentage of the combustion air through the overfire air compartments and increases combustion staging.

The NO_x reduction for overfire air, between 16% and 22% of the normal operational level, is typical for tangentially fired coal-firing utility boilers. The relationship for NO_x versus excess oxygen with overfire air is linear, also, with a slope of approximately 55 ppmv for each percent change in excess oxygen. For the 18% excess air (3.0% excess oxygen) operating point NO_x emissions of approximately 300 ppm (0.41 pounds per million Btu) have been

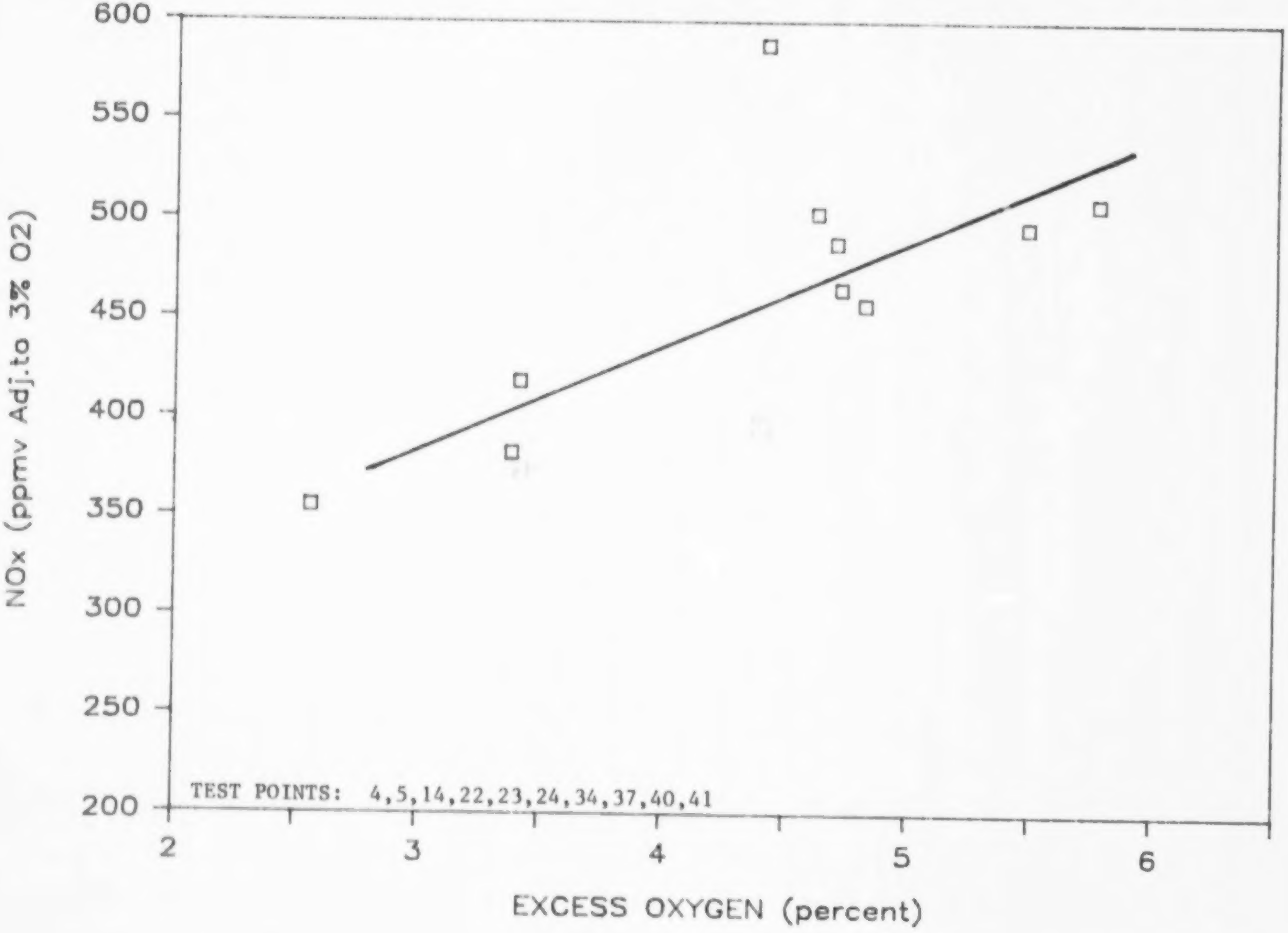


Figure 23. Baseline NO_x versus excess oxygen at full load and without overfire air.

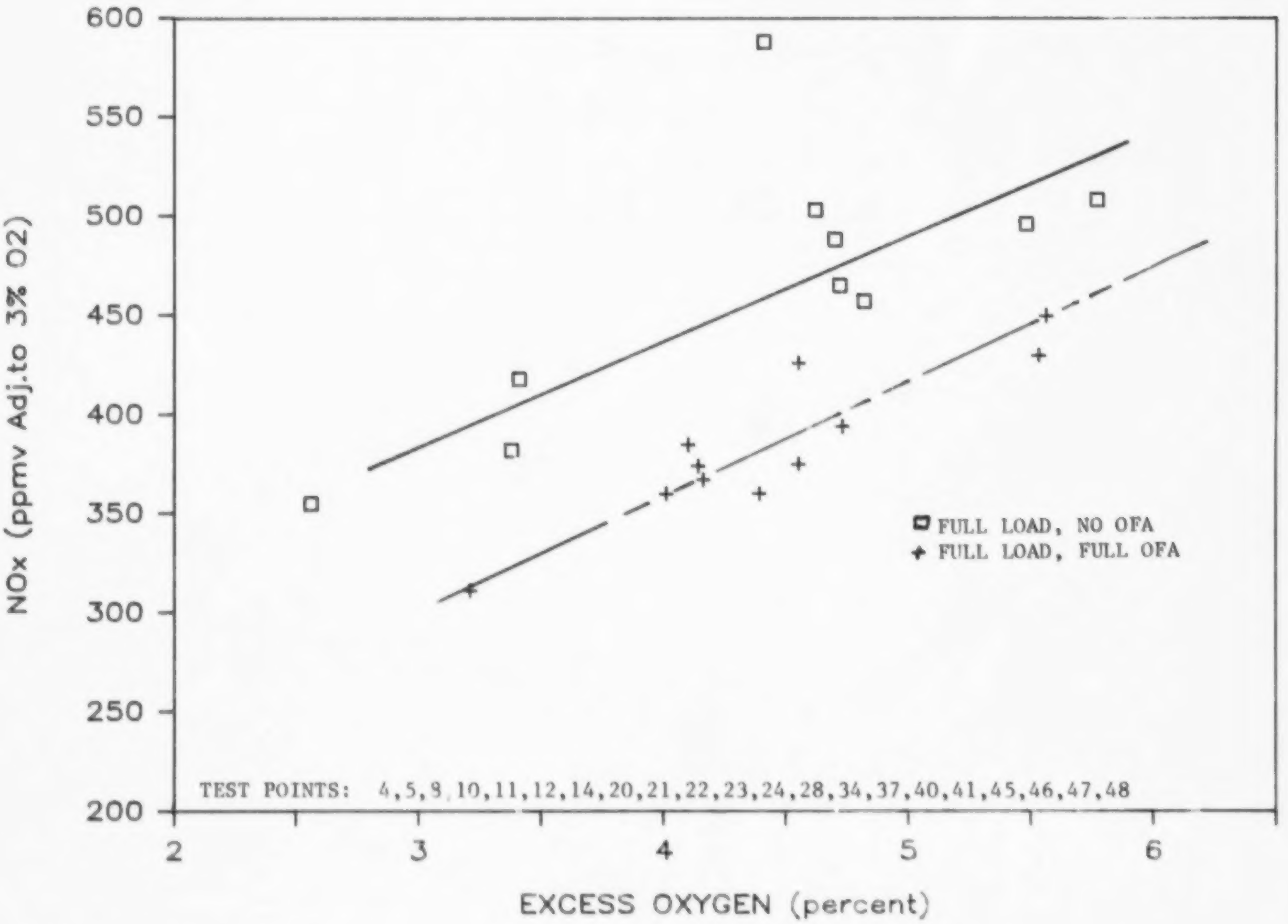


Figure 24. Baseline NO_x versus oxygen at full load with overfire air.

shown. Operation at below this excess air level produced lower NO_x emissions but at the expense of combustion efficiency (higher flue gas carbon monoxide levels).

Effect of Overfire Air Tilt on NO_x

The effect of overfire air tilts on NO_x emissions is shown in Figure 25. Because of the limited amount of data available from the tests, and the inability to separate out several of the other controlling variables, these results are qualitative at best. That is, as stated previously, changes in excess air when firing with overfire air have a synergistic effect on NO_x reduction. Also, the burner tilts interacted with the overfire air tilts during several tests and confused the relationship.

The basis for changes in NO_x emissions with overfire air tilts is simply the physical separation of the overfire air stream from the burner/remaining combustion air stream. Larger separation causes more combustion staging. Therefore, higher overfire air tilts should produce lower NO_x emissions for similar burner tilts. To verify this trend a qualitative attempt to "back out" the interrelationships stated above was done. This analysis has shown that NO_x emissions are reduced approximately an additional 20 ppmv to 30 ppmv when the overfire air tilts are raised from horizontal to plus thirty (30°) degrees. And, in a similar fashion, NO_x emissions reductions with overfire air are lessened when the overfire air tilts are lowered below horizontal.

Additionally, during the characterization testing it was determined that operating at plus thirty degrees overfire air tilt was unstable. While efficient operation was shown to be possible there appeared to be a potential for high carbon monoxide (CO) levels. This became evident with several of the tests and, therefore, raised OFA tilt operation was not recommended as a method to lower NO_x.

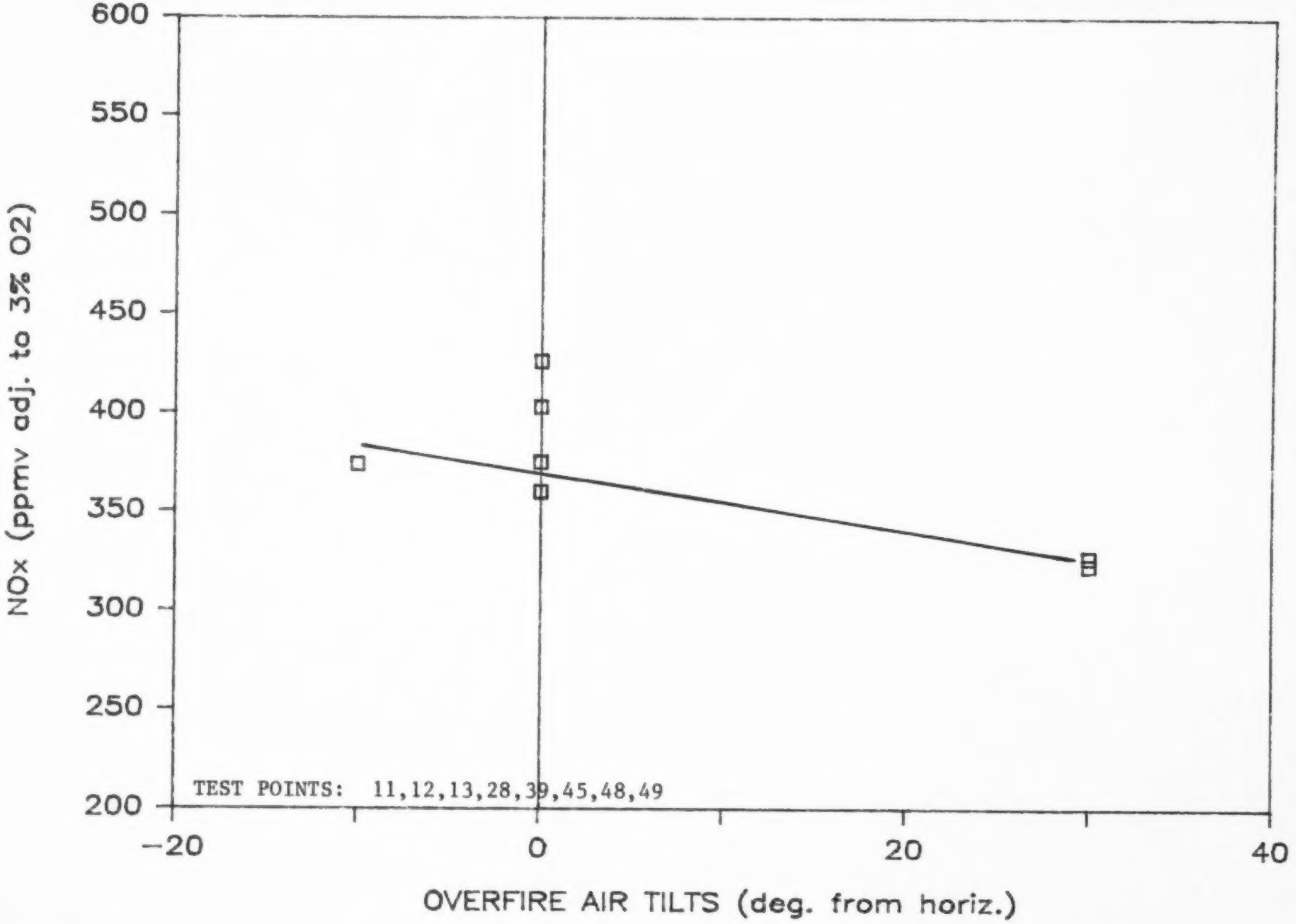


Figure 25. Baseline NO_x versus overfire air tilts at full load with full overfire air.

Effect of Fuel Air Dampers on NO_x

The effect of fuel-air flow or fuel compartment secondary air was analyzed during the baseline characterization tests. This was done by modulating the fuel air dampers (FAD) between 50% and 100% open. Figures 26 and 27 show the effect of fuel-air dampers on NO_x emissions without and with overfire air, respectively. For the no overfire air case there is a definite decrease in NO_x emissions when the fuel-air dampers are partially closed. The magnitude of the decrease in NO_x is approximately 30 ppmv to 50 ppmv.

This decrease in NO_x emissions can probably be attributed to either of two reasons. First, closing the fuel-air dampers redistributes the combustion air away from the fuel jet. And second, the flame front or point of stable fuel ignition is moved closer to the burner when the fuel-air dampers are closed. The characterization tests were not able to discern which effect promoted the NO_x reduction.

For the overfire air case the effect of closing the fuel-air dampers on NO_x is not as great although there does appear to be the same general trend of decreasing NO_x for decreasing fuel-air damper opening. As Figure 27 shows there was only limited data available to analyze this effect. And, to compound the difficulty in analyzing this relationship, the two highest NO_x values of the four fuel-air damper with overfire air tests had positive burner tilts (which will be shown later to increase NO_x when overfire air is present); and the two lowest NO_x value tests had positive overfire air tilts (which were shown above to decrease NO_x). Data for the upper two tests, baseline test numbers 18 and 19, and the lower two tests, 25 and 50, are presented in Appendix B. Upon normalizing the data points to horizontal burner and overfire air tilts a qualitative trend of 25 ppmv to 35 ppmv decrease in NO_x by closing the fuel-air dampers to 50% open is shown.

This reduction in the effectiveness of closing the fuel-air dampers on NO_x for the overfire air case versus the non-overfire air case is elucidated next. When firing with overfire air, both the flow and the velocity of the

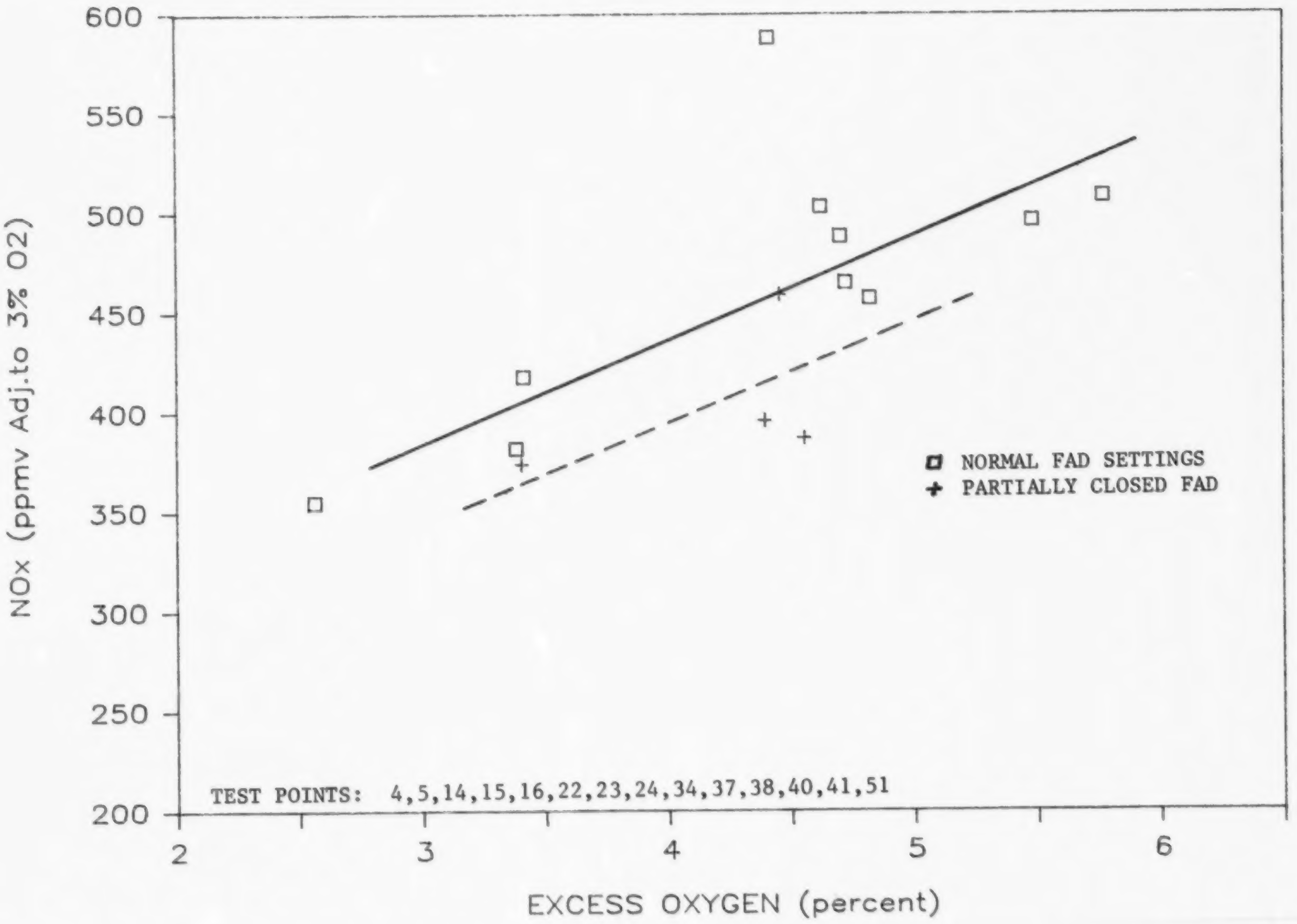


Figure 26. Baseline NO_x versus excess oxygen at full load without overfire air and with partially closed fuel-air dampers.

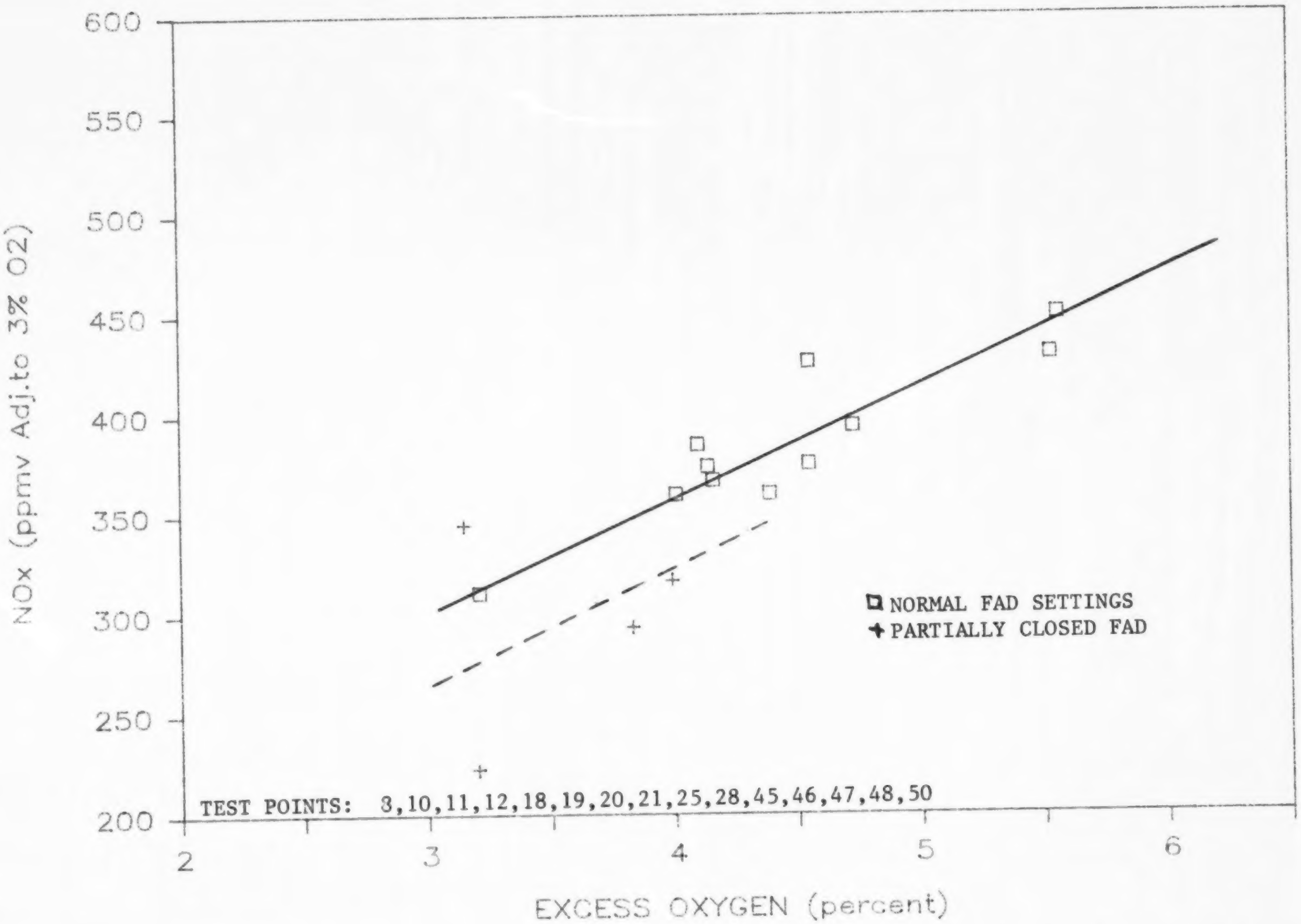


Figure 27. Baseline NO_x versus excess oxygen at full load with overfire air and partially closed fuel-air dampers.

fuel-air are decreased, therefore, closing the fuel-air dampers will have less effect on both the redistribution of combustion air and the movement of the flame front.

Effect of Burner Tilts on NO_x

As stated previously, burner tilts can have an effect on NO_x emissions. Theoretically, what occurs as burner tilts are changed is a shifting of the flame envelope in the furnace. This shifting causes changes in the furnace heat absorption profile and consequently changes in the gas time/temperature history. That is, as the burner tilts are lowered and the flame envelope lowers, the furnace waterwall heat absorption will increase and the gas temperatures will decrease slightly. However, it should be noted that this effect occurs only if the burner tilts are manually forced to change. In the automatic mode (and at a constant loading), the burner tilts respond to the reheater steam outlet temperature so that it stays constant for varying waterwall slag conditions. In this case the furnace heat absorption and gas temperatures remain approximately the same as the burner tilts change. Therefore, any effect that the burner tilts have on NO_x would be only temporary. The effect that they have on NO_x is typically lowering NO_x for lowering burner tilts because of lower thermal NO_x formation. (Although some boilers do respond atypically due to change in flame swirl and furnace hopper gas recirculation).

For the host furnace, the baseline tests showed decreasing NO_x for decreasing burner tilts. See Figure 28. A change in the burner tilts of thirty degrees from +20° to -10° lowered NO_x emissions by approximately 50 ppmv. The conditions which resulted in these values were full load, no overfire air, and excess oxygen between 3.5% and 4.5%. Again, it must be stressed that changing the burner tilts as was done during the testing is not a normal practice and it is not intended to be NO_x reduction method.

Effect of Overfire Air and Burner Tilt Differential

The control system for the host boiler has manual drives for the overfire air tilts and automatic drives for the burner tilts. Therefore, during normal

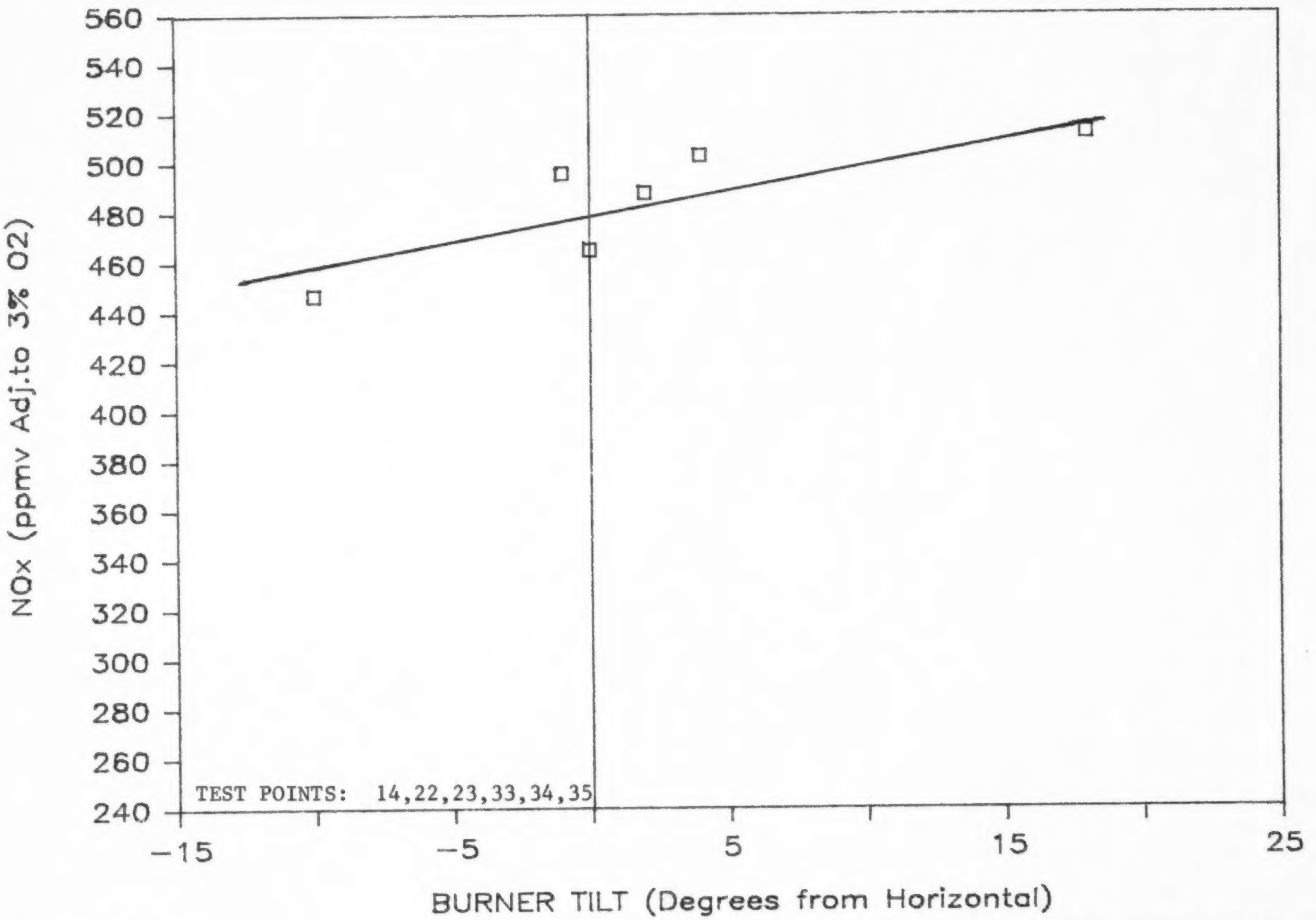


Figure 28. Baseline burner tilt versus NO_x at full load without overfire air and with excess oxygen levels between 4.5% and 5.5%.

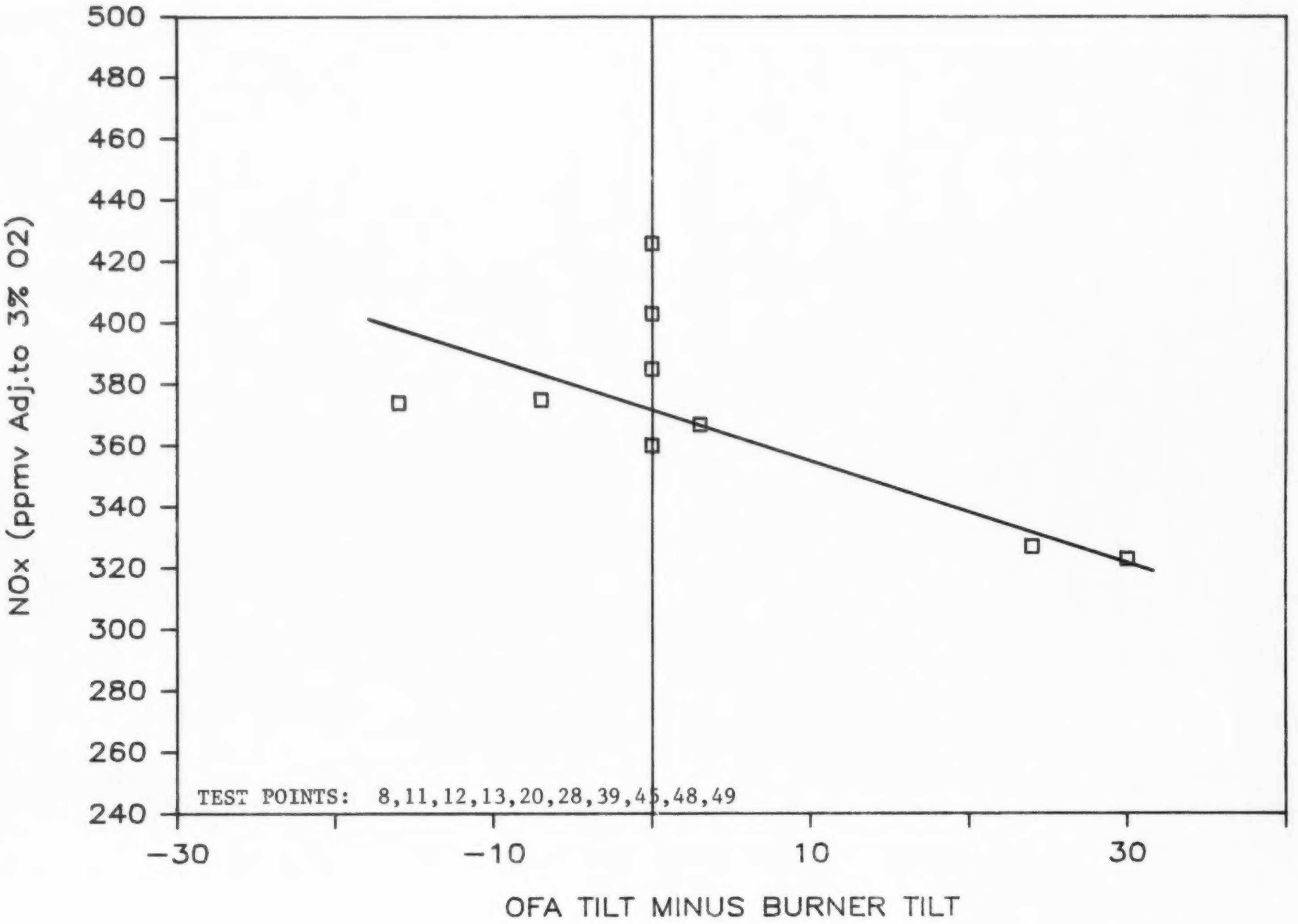


Figure 29. Baseline overfire air tilt/burner tilt differential versus NO_x at full load, greater than 60% overfire air and excess oxygen levels between 3.5 and 4.5 percent.

boiler operation, the difference between the two tilts is continually changing. Figure 29 shows the relationship of this tilt differential on NO_x emissions. The figure shows that as the tilt differential increases the NO_x emissions decrease. This result is reasonable because the tilt differential is similar to the included angle between the fuel and overfire air streams. As this angle decreases (or even becomes negative) the physical separation between the two streams decreases. The potential range for this differential is -40° to +55° although the extremes of this range are usually not achieved during normal boiler operations. A change in the tilt differential of 40° is possible during normal boiler operation due to changing slagging and fouling conditions. Therefore, it would not be unreasonable to see NO_x emissions vary by 60 ppmv during constant load and constant excess air conditions because of this tilt differential variance.

These results also show the interrelationship of the two trends previously shown, i.e., overfire air tilt and burner tilts. It also shows that the changes in NO_x emissions due to the individual trends are approximately additive when the two processes are combined. This additive response is also shown by the spread of data at the zero tilt differential on Figure 29. The range of excess oxygen used to develop this figure was 3.5% 02 to 4.5% 0½. This one percent oxygen range can cause NO_x emissions to change by 55 ppmv. Upon normalizing this data to 4.0% 0½ the scatter is considerably reduced. (The data points presented for zero differential are baseline tests 8, 28, 39, 45 and 48 shown in Appendix B). From this normalizing it can be seen the effect of excess oxygen on NO_x is also additive to the other processes.

Effect of Unit Load and Fuel Elevations in Service on NO_x

The baseline characterization tests included thirteen (13) tests conducted at reduced boiler load. Seven (7) test had the lower four fuel elevations (BCDE) in service; five (5) tests had the upper four fuel elevations in service; and one test was conducted with all five fuel elevations in service. The load set point for the tests was 300 MWe which is

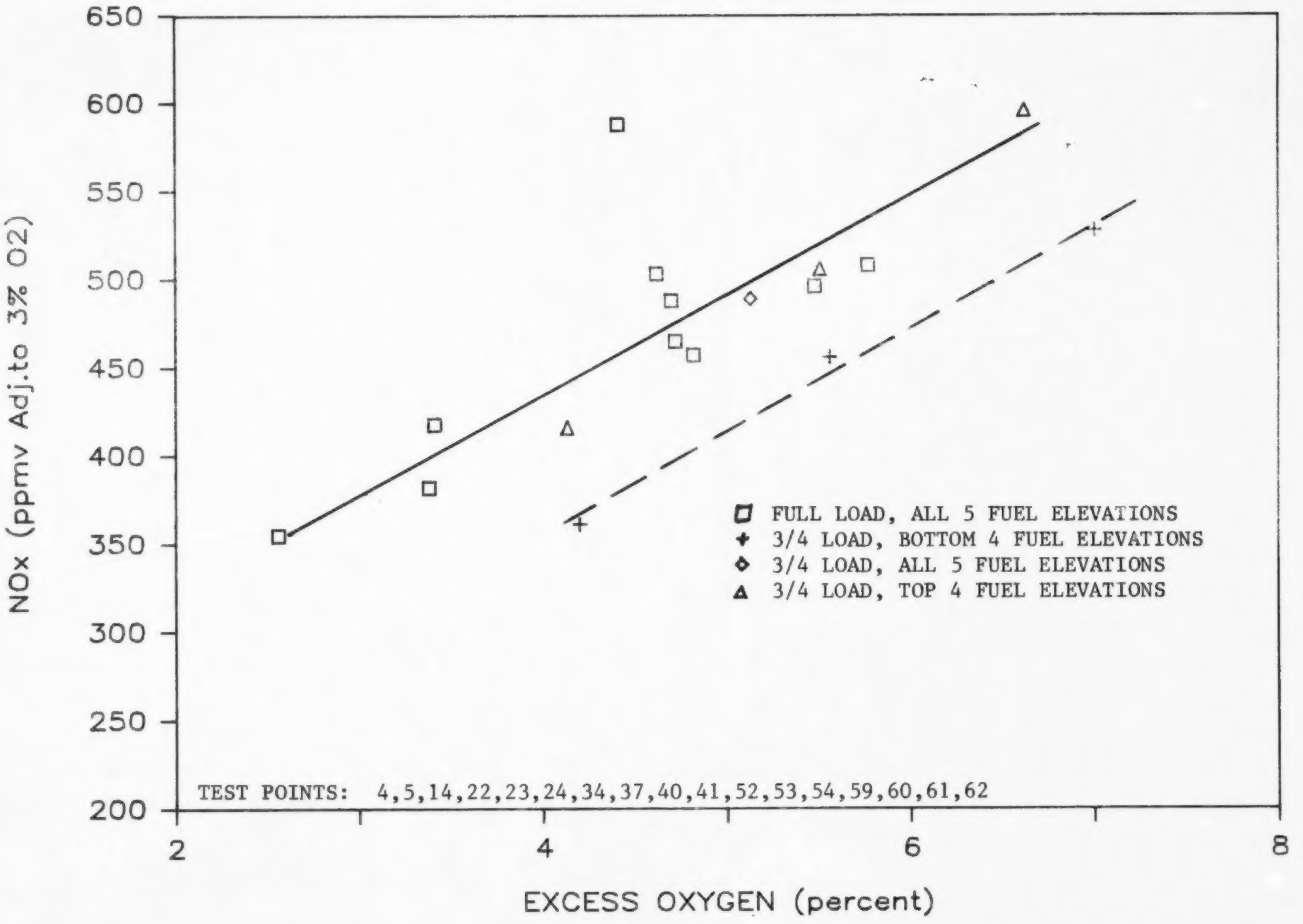


Figure 30. Baseline NO_x versus excess oxygen at full and 3/4 load without overfire air showing fuel elevations relationship.

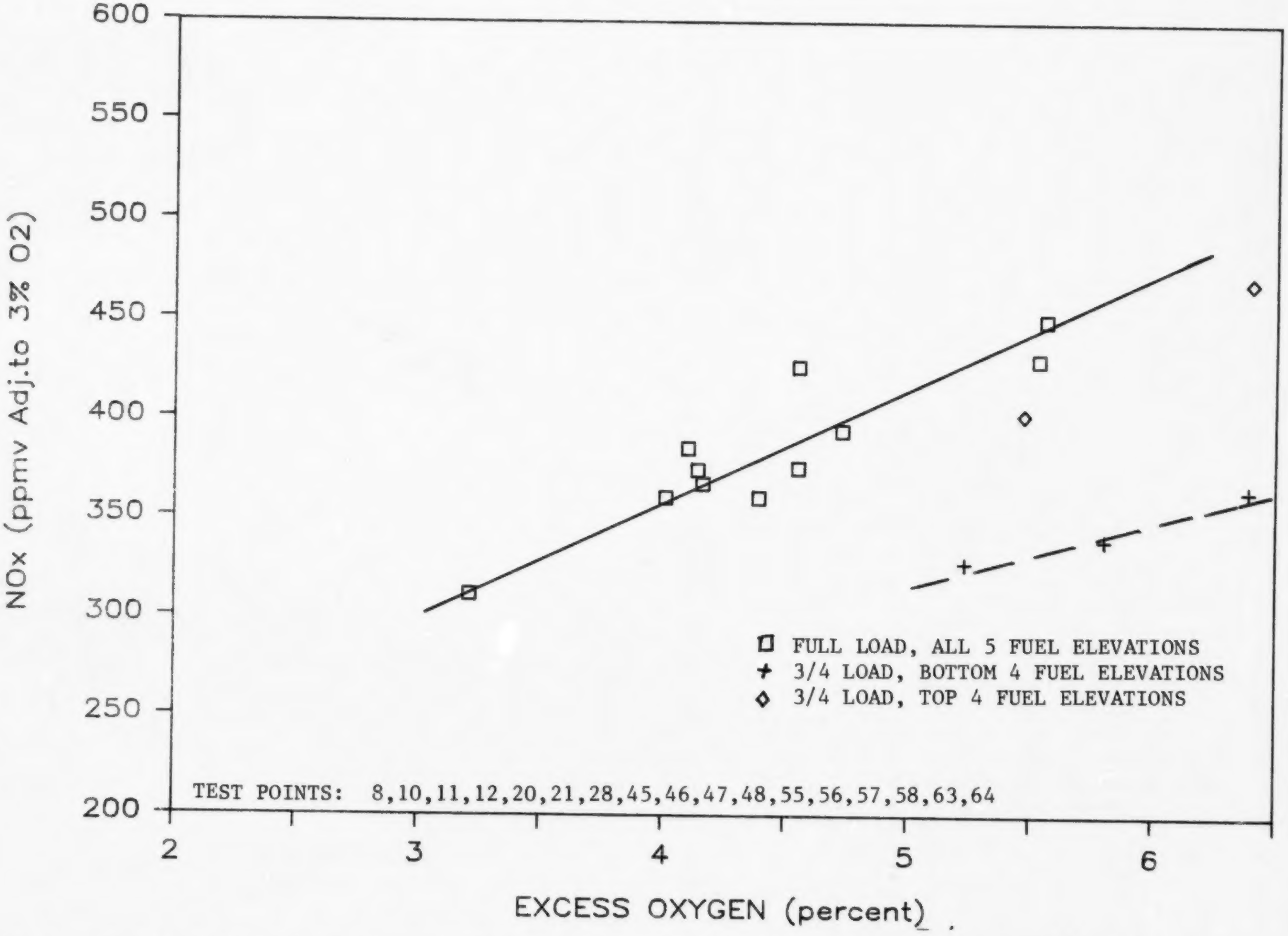


Figure 31. Baseline NO_x versus excess oxygen at full and 3/4 load with greater than 40% overfire air showing fuel elevations relationship.

three-quarters of the nominal full load rating. Figures 30 and 31 show the effect of boiler load and fuel elevations in service on NO_x emissions without and with overfire air, respectively.

As shown, for the boiler loads tested, load does not effect NO_x emissions. There are, however, several other factors that are effected by load and which do effect NO_x emissions. Three of these factors are fuel elevations in service, overfire air flow, and excess air. Both Figures 30 and 31 show that the fuel elevations in service have an effect on the NO_x emissions. Firing with the lower four of five elevations produces lower NO_x both with and without overfire air.

Firing with either all five, or the top four, elevations had emissions similar to those at full load. This result qualitatively shows that thermal NO_x emissions represent a small percentage of the total NO_x emissions for this coal-firing unit. That is, because the NO_x emissions did not change when the unit load was dropped from full to three-quarters during which the furnace gas temperature would drop by more than 100°F, then thermal NO_x emissions are minimal.

The primary reasons why NO_x emissions decreased for the lower four elevations in service were greater degree of combustion staging and increased residence time. When firing with overfire air this firing arrangement has one whole additional fuel elevation of physical separation between the fuel and overfire air streams. When firing without overfire air there is still a small amount of cooling air that flows through the unused fuel and overfire air elevation. At reduced loads this air represents a greater percentage of the combustion air and thus can result in staged combustion.

Firing with the lower four elevations at this load is not a normal operation. At this load the operators typically use the upper four elevations to maintain superheater and reheater steam temperatures. If the lower four elevations are used the burner tilts typically are in the uptilt position. And, as shown previously, NO_x has been shown to increase in the uptilt position.

Additional results shown in Figures 30 and 31 include the similarities in NO_x reductions due to excess air reductions for both full and reduced load. This is shown both with and without overfire air. Also the NO_x reductions possible with overfire air are similar for full and three-quarter load when utilizing either all, or the top four, fuel elevations. With the lower four elevations in service and OFA in use there is an additional NO_x reduction of 80 ppmv.

Two operating parameters which change at reduced loads and tend to inhibit NO_x reductions are: increases in excess oxygen; and, limitations on the use of overfire air. At loads below 300 MWe the excess oxygen set point increases gradually to 6.0% O2. The principal reason for this increased airflow is to act as a furnace gas dilutant. Increased air lowers both the furnace gas temperatures and waterwall absorption rates and thus reduces the amount of steam generated. However, additional heat is absorbed in the superheater and reheater surfaces to generate higher, more efficient, finishing steam temperatures.

Even with the increase in excess air, the total airflow to the furnace decreases. Therefore, to maintain some control over the air distribution in the windboxes, the overfire air flow must decrease. These two factors minimize the low load NO_x reduction potential of two full load prime NO_x reduction methods.

III. BASELINE CHARACTERIZATION CONCLUSIONS

Normal baseline operating conditions of full load, no overfire air and 4.5% to 5.0% excess oxygen produced NO_x emissions of 450 ppmv to 460 ppmv (adjusted to 3% oxygen). The NO_x reduction potential for the following eight parameters were evaluated.

1. Excess Air
2. Overfire Air
3. Burner Tilt
4. Overfire Air Tilt

5. Overfire Air/Burner Tilt Differential
6. Fuel Compartment Airflow
7. Load
8. Fuel Elevations in Service

With regard to the effect of excess air (or excess oxygen), NO_x emissions are changed approximately 45 ppmv or 55 ppmv without and with overfire air, respectively, for each percent change in the excess oxygen level. The minimum efficient excess oxygen operating point appears to be between 2.5% and 3.5% O_2.

Use of overfire air reduces NO_x emissions between 75 ppmv and 100 ppmv depending on the excess oxygen level. These reductions are approximately additive to the excess air reductions.

Lowering the burner tilts, raising the overfire air tilts or increasing the overfire air/burner tilt differential all reduce NO_x emissions. Lowering the burner tilts when no overfire air is used will lower NO_x emissions about 50 ppmv for a thirty degree (30°) burner tilt change. With overfire air, NO_x decreased 30 ppmv with a twenty degree (20°) lowering of the burner tilts. Tilting the overfire air tilts up from horizontal to plus thirty degrees (+30°) lowers NO_x by about 25 ppmv. However, operating at 30° OFA tilt is not recommended due to a potential for high carbon monoxide levels. The overfire air/burner tilt differential analysis showed that the two individual trends are additive with respect to NO_x reductions.

A reduction in the amount of fuel-air (or fuel compartment secondary air) resulting from the closure of the fuel air dampers from 100% to 50% yields NO_x reductions of approximately 20 ppmv and 40 ppmv with and without overfire air, respectively.

Finally, for the boiler loads tested, load, by itself, does not directly effect NO_x emissions. However, biasing the fuel through the lower fuel elevations can reduce NO_x by 80 ppmv.

As stated above, these NO_x reduction techniques were approximately additive. However, the lowest NO_x emissions achievable without degradations to boiler performance were approximately 300 ppmv (adjusted to 3% oxygen). The conditions set to achieve this value were full load, 3.0% excess oxygen and full overfire air.

One final note, based solely on these tests the plant operators subsequently lowered the operating excess oxygen setpoint from 4.0% to 3.0% 0_2. This yielded an operating range change from 4.5%-5.0% 0½ to 3.5%-4.0% 0_2 due to trim effects. Thus, these characterization tests provided the basis for improved combustion air management on this unit.

Conversion Table

English Units to SI Metric Units

To Convert From	To	Multiply By
1E3 LB/HR	Kg/S	1.25998E-1
PSIA	MPa	6.89476E-3
LB/1E6BTU	ng/J	4.2992E-2
1E6BTU/HR	MJ/s	2.9307E-1
BTU/LB	KJ/Kg	2.326

$°F = 1.8\ (°C) + 32°$

Emissions Corrected to 3% O_2 = Actual Emission (21-Actual O_2)/(21-3)

NO_x; LB/1E6BTU = PPM (1.192 E-7) (20.9) (F_{factor})/(20.9 - Actual O_2)

Where:

$$F_{factor} = \frac{1E6\ [3.64(\%H) + 1.53\ (\%C) + 0.57\ (\%S) + 0.14\ (\%W) - 0.46\ (\%O)]}{HHV}$$

and where the F_{factor} has units of DSCF/1E6BTU at 0% O_2

PART D

POST-MODIFICATION CHARACTERIZATION TESTING

I. POST-MODIFICATION TESTING OBJECTIVE

The two prime objectives of this phase of the program were first, to determine the lowest NO_x emissions level possible while maintaining efficient boiler operation. And second, to determine the optimal firing arrangement that would produce low NO_x emissions over the entire load range of the boiler.

Optimization Testing Procedure

The method utilized to achieve these objectives consisted of conducting five short-term characterization test series. The first test series was completed during November, 1981. It included 86 tests, (numbered 101 through 187) with all but three at full load. The primary emphasis for this test series was the offset air firing angle and its effects on boiler performance and emissions. Three different offset air angles were analyzed which represented the minimum, middle and maximum range of offset operations. The horizontal separation from the fuel firing angle that these values represent were 17°, 25° and 33°, respectively. The variables analyzed for each of these angles were excess oxygen, burner tilts, fuel-air damper settings and auxiliary air damper settings. Seven tests were conducted with overfire air but OFA was not fully evaluated because the primary emphasis of this test series was to ascertain the effectiveness of the concentric firing system by itself.

Based on the results from the first test series, and particularly the NO_x reductions achieved when the concentric firing system was combined with overfire air, a second series of tests was conducted during March, 1982. A total of 68 tests (numbered 201 through 269) were performed, of which all except five had overfire air.

Subsequent to the second test series a modification was made to the concentric firing system during an annual maintenance outage. This modification consisted of installing a divergent tip attachment to the coal nozzle tips. This attachment, called either a flame holder or flame diffuser, diverted the fuel air stream away from the coal/primary air stream. (This feature is shown in Figure 12 in Part A - Windbox Modifications). The impetus for this design change resulted primarily from the evaluation of the first series of post-modification testing.

The analysis of data from the first test series showed that NO_x emissions reductions could be further optimized by placing additional limitations on the fuel-air momentum. The tests had shown that if this decrease in momentum is accomplished with substantial decreases in the fuel-air flow rate, then high carbon monoxide levels could result. Therefore, a design was chosen which would decrease the momentum, and thereby bring the ignition point closer to the tip, without decreasing the fuel-air flow rate.

This optimized design was tested during the third series of post-modification testing conducted during September and October, 1982. A total of 105 tests were conducted during this period (tests 301 through 405) to evaluate various boiler loads, offset angles, overfire air flow rates, OFA tilts, burner tilts, excess airs and fuel air damper settings. This testing provided the basis for establishing the long-term low NO_x operational procedure. NO_x emissions levels of 0.3 pounds per million Btu or less were recorded for seventeen tests, seven of which had carbon monoxide levels below 84 ppmv.

A decrease in the power demand caused the base load (daytime normal operating point) to lower from 400 MWe to 300 MWe and caused the base night load to drop from 300 MWe to 200 MWe. This necessitated the performance of a short series of tests to determine if the recommended low-NO_x operating procedure could be improved for low load operation. This short series was conducted during March, 1983 and consisted of 44 tests (numbered 501 through

545). These tests confirmed the findings of the baseline characterization testing which had shown that the low load NO_x reductions are limited due to the excess air, overfire air and fuel elevation requirements.

One final test series was conducted following the final boiler maintenance outage to verify the boiler performance and emissions levels. This test consisted of 20 tests (numbered 601 through 620) and was done in March, 1984. Additionally, these tests served as a basis for determining the effects on emissions and performance of the partially restored fuel compartments. (See Part A - Windbox Modifications). In general, the results from this series have shown minimal changes in emissions with the increased fuel air free area.

II. PARAMETRIC EVALUATION

Appendices A and B present the test data for all of the emissions and boiler performance analyses discussed in this report. Reiterating the baseline characterization results, a NO_x emissions level of 450 ppmv to 460 ppmv (adjusted to 3% 02) was shown for normal full load operating conditions. These conditions were: flue gas oxygen level of 4.5% to 5.0% 02; no overfire air; and horizontal burner tilts. Adding overfire air lowers NO_x by approximately 75 ppmv to 100 ppmv. Lowering the excess air or lowering the flue gas oxygen level reduces NO_x emissions by approximately 40 ppmv to 50 ppmv per one percent decrease in the flue gas oxygen level. A minimum NO_x level of approximately 300 ppmv (adj. to 3% 02) was achieved during the baseline tests.

Effect Of Excess Oxygen On NO_x

Figure 32 presents the effects that the excess oxygen level has on NO_x emissions. The figure presents the two generations of the low NO_x system, with and without flame holders. The results from the baseline characterization tests are replotted for reference. As shown, the concentric firing system without the flame holders and without overfire air produces NO_x emissions similar to the baseline level. However, with the flame holders, NO_x

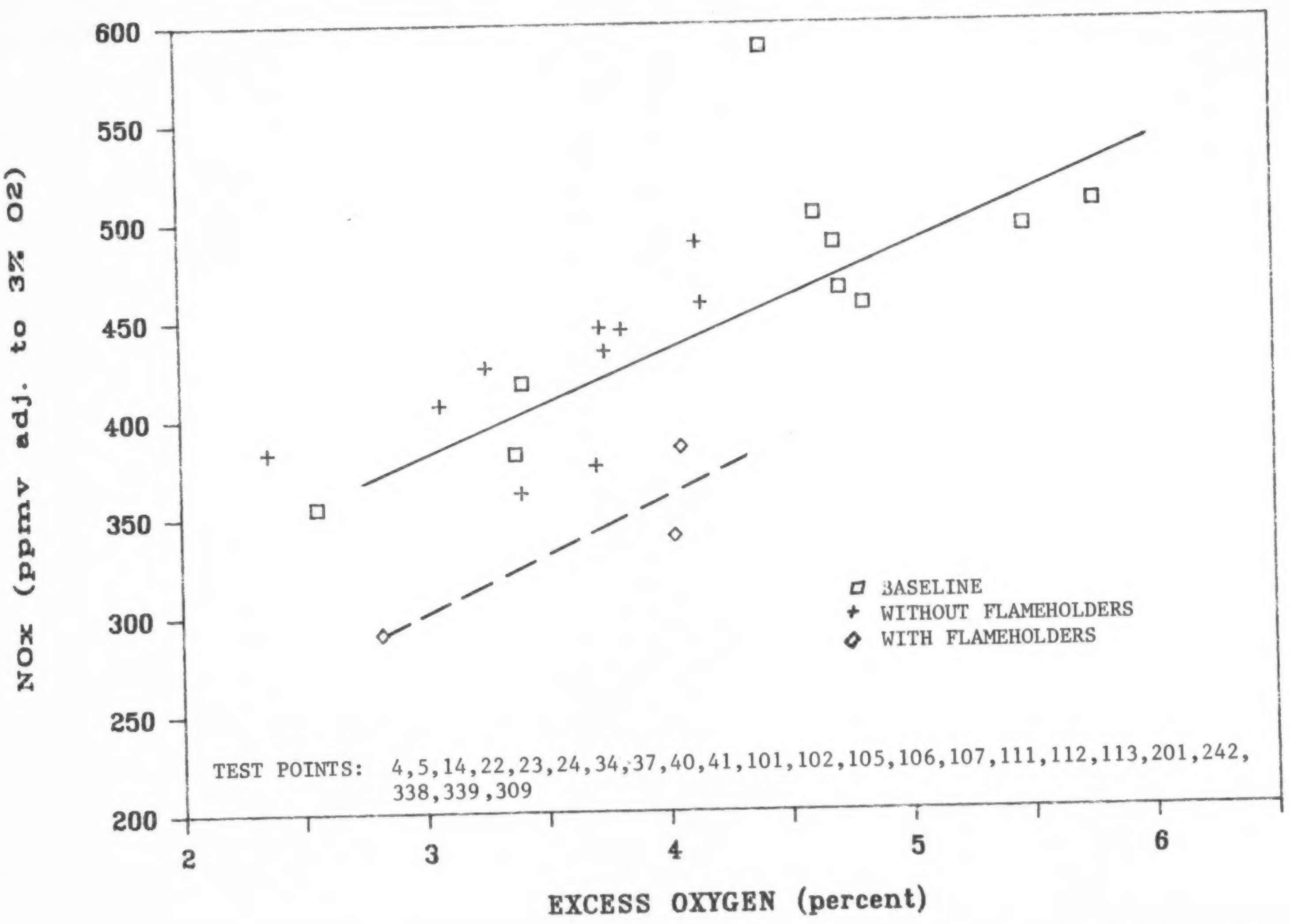


Figure 32. Baseline and post-modification NO_x versus excess oxygen at full load, without overfire air, with and without flame holders.

emissions are reduced between 60 ppmv and 80 ppmv from baseline levels. This verifies the importance of establishing an early stable ignition front in a NO_x reduction strategy for diffusion type burners. It also shows, by the similarities of the two trend line slopes, that the reduction in NO_x due to decreasing excess air has been uneffected by the modifications. Therefore, the full load NO_x emissions at a judicious 3.0% flue gas oxygen level is approximately 310 ppmv to 320 ppmv (adjusted to 3% 02) when firing with the second generation low NO_x system without overfire air.

Effect Of Overfire Air On NO_x

Figures 33 and 34 show the effects of overfire air and overfire air uptilt on NO_x emissions for both the first and second generation low NO_x systems. Figure 33 presents three distinct data trends for firing with overfire air with horizontal overfire air tilt. The baseline characterization trend has been replotted. The first generation (LNCFS only) low-NO_x system trend is shown directly below the baseline function at approximately a 50 ppmv reduced NO_x level.

A comparison of Figures 32 and 33 shows that for the first generation low NO_x system, overfire air, by itself, lowers NO_x emissions by approximately 120 ppmv to 130 ppmv. This compares to the baseline characterization reduction for overfire air of 70 ppmv to 100 ppmv. It is currently felt that the additional NO_x reduction achieved with the LNCFS and OFA versus OFA alone may be due to the increased air pressure drop across the auxiliary compartments. The additional pressure drop was induced by the offset firing system. This could effect NO_x in either of two ways. First, the increased pressure drop would force a greater amount of air through the overfire air registers. And second, because the auxiliary compartment airflow was reduced, the offset air jet velocity would be lower. This lower velocity would yield reduced jet penetration into the furnace and intercorner air mixing.

No direct correlation is possible with the second generation low NO_x system between the full overfire air and no overfire air cases due to the skewness of the two trends. However, the range of NO_x reduction for overfire air increased from approximately 45 ppmv at 3.0 percent oxygen to 105 ppmv at 4.5 percent oxygen.

The second generation (LNCFS and flame holders) low-NO_x system is shown to have a similar NO_x level at the 3.0% oxygen level but the trend slope or relationship between NO_x and excess oxygen is significantly flatter. No clear justification has been confirmed for this differing relationship. However, it has been postulated that the decreasing rate of NO_x reduction may mean that the results are approaching the low NO_x emissions limit for this type of burner, boiler, and fuel configuration. Figure 34 shows lower NO_x emissions but the same lower rate (trend slope) of NO_x reduction is apparent. It is further postulated that the lower limit for NO_x reduction of bituminous type coals with the staged combustion technique is being approached. This postulate is based on the premise that staged combustion primarily reduces the volatile matter fuel-NO_x . Although some staging techniques have a minor effect on thermal-NO_x by extending the combustion heat release zone of the furnace. (For tangential firing, extending the windbox height, increasing the burner elevation centerline spacing or increasing the overfire air tilt/burner tilt differential can increase the release zone height).

The reader should note that while Figure 34 depicts 200 ppmv NO_x levels at 3.0% excess oxygen with acceptable boiler performance, it has been previously shown that operating at a high overfire air tilt may generate unacceptable carbon monoxide and combustion efficiency levels.

Another trend shown in Figure 34 is the parallelism of the NO_x versus excess air relationships with and without the flame holders. This may be a result of the first generation low-NO_x system approaching its low-NO_x limit, also. Comparison of Figures 33 and 34 show that NO_x is reduced approximately 30 ppmv when changing the overfire air tilt from horizontal to greater than 15 degrees uptilt. This reduction due to tilt changes is apparent for both the first and second generation low-NO_x systems. The reduction is also comparable to the baseline characterization results.

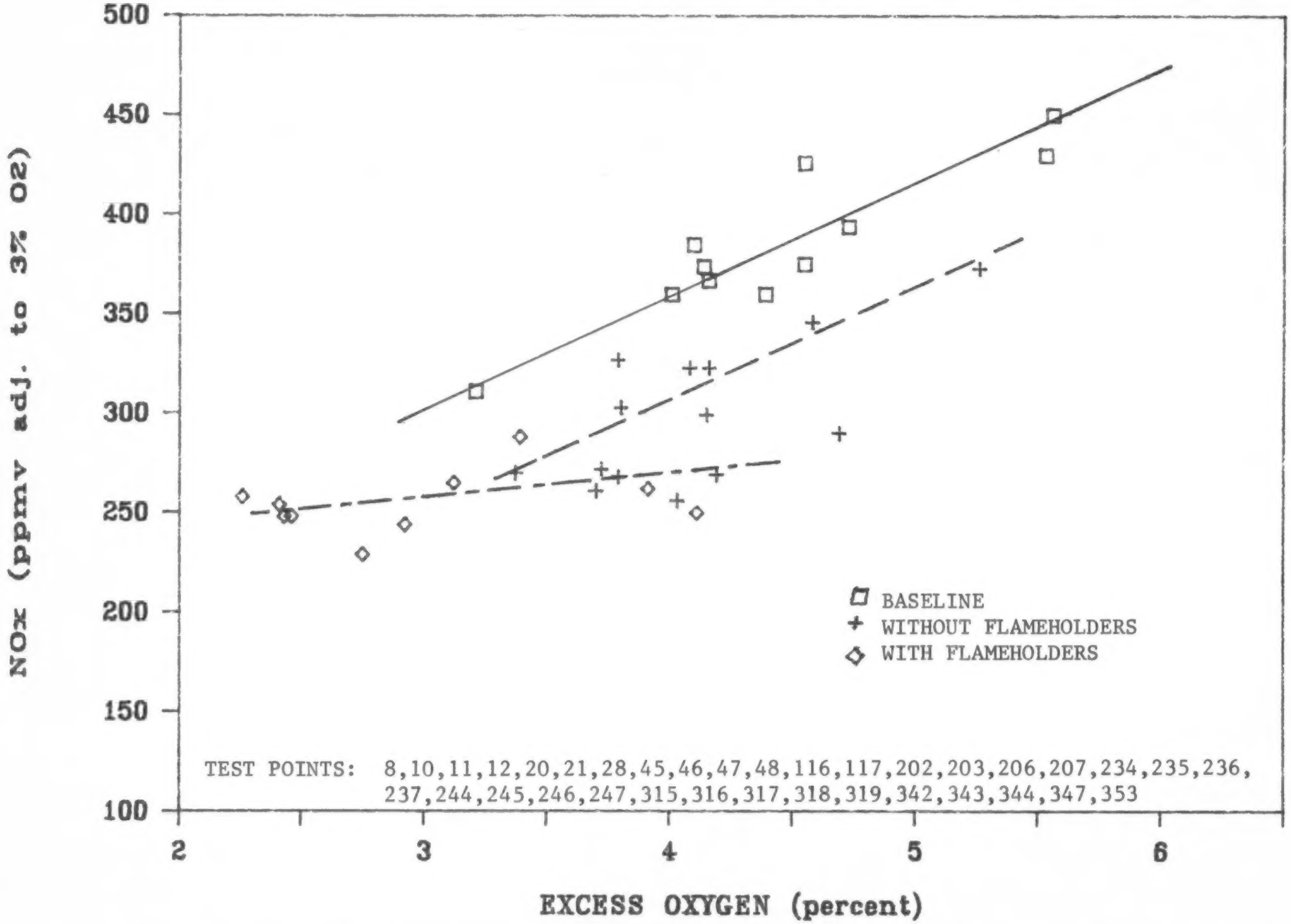


Figure 33. Baseline and post-modification NO_x versus excess oxygen at full load, with overfire air, with and without flame holders.

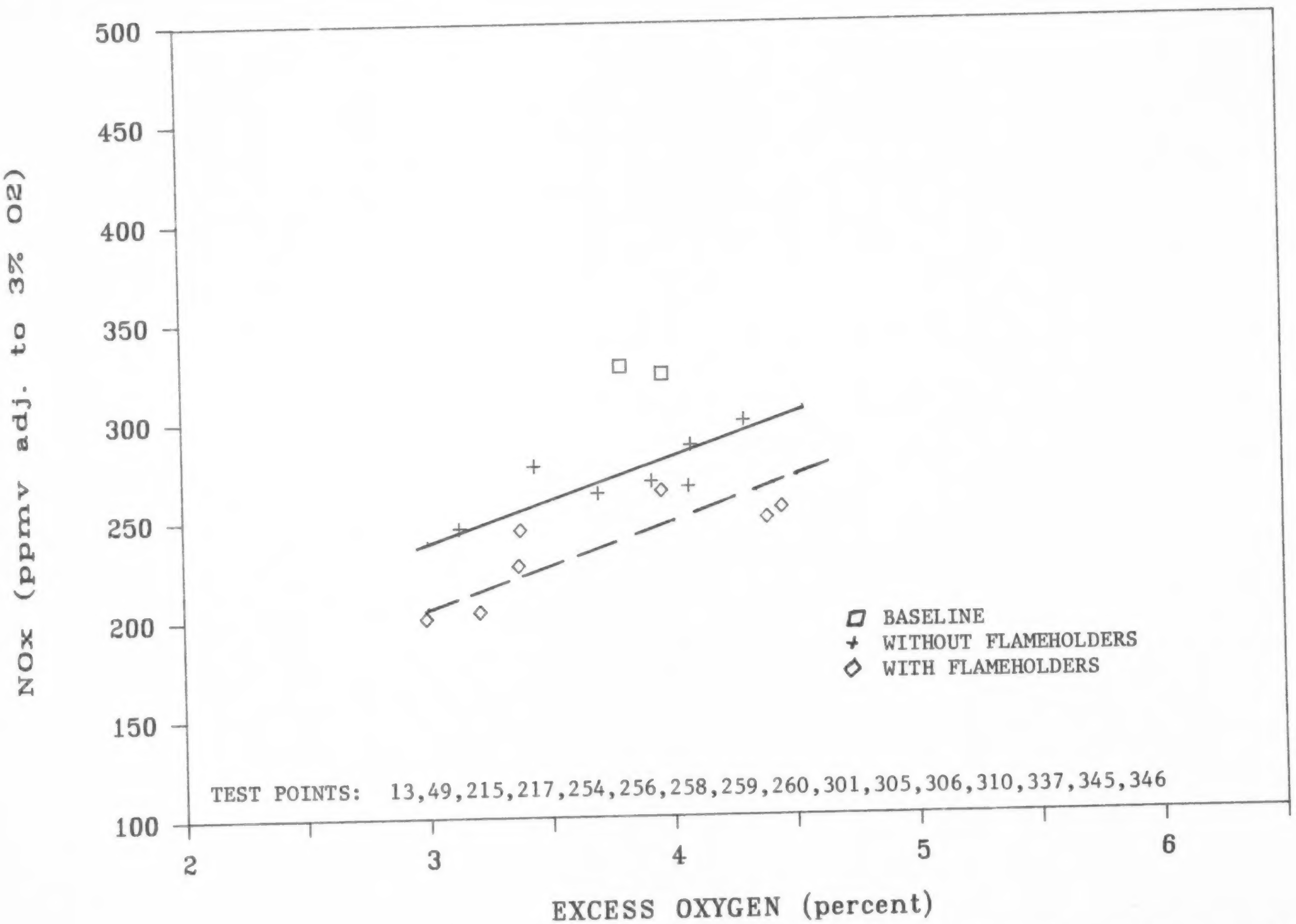


Figure 34. Post-modification NO_x versus excess oxygen at full load, with overfire air, uptilted overfire air, with and without flame holders.

Effect Of Burner Tilts On NO_x

Figures 35 and 36 present the effects of burner tilts on NO_x emissions. Figure 35 shows the Baseline Characterizations results and the second generation low-NO_x system results. The first generation low-NO_x system was not presented because there were no tests that had other than horizontal burner tilts concurrent with having horizontal overfire air tilts, therefore, no trend could be developed. Several distinct trends shown in Figure 35 include the similarities of increasing NO_x for increasing burner tilt for both the baseline and low-NO_x system characterizations. Also, the NO_x reduction from the baseline results to the second generation results is greater than 100 ppmv.

The magnitude of the NO_x increase as the burner tilts were raised from -10° to +20° was approximately 50 ppmv. This is comparable to the baseline burner tilt characterization results (Figure 28) and the baseline overfire air/burner tilt differential results (Figure 29). For this excess oxygen level, 3.5 percent to 4.5 percent, and horizontal overfire air tilts the minimum NO_x level achieved with downtilted burners was approximately 250 ppmv.

Figure 36 presents the same relationship with raised overfire air tilts. The scatter of data for the two generations of low-NO_x systems and the limited data from the Baseline Characterizations permits only approximate trend lines. However, several tendencies are shown. One tendency shown is the decrease in NO_x emissions for both the First and Second Generation low-NO_x systems from the baseline levels. The First Generation system appears to have reduced NO_x emissions by about 40 ppmv. The Second Generation system lowered NO_x by an additional 30 ppmv or a total of 70 ppmv from the baseline levels. This 70 ppmv reduction from the Baseline levels to the Second Generation levels compares directly to the greater than 100 ppmv reduction for horizontal overfire air tilt shown in Figure 35. Further comparison of Figures 35 and 36 shows that, contrary to the baseline results, uptilting the overfire air nozzles with the low-NO_x modified burners reduces NO_x negligibly.

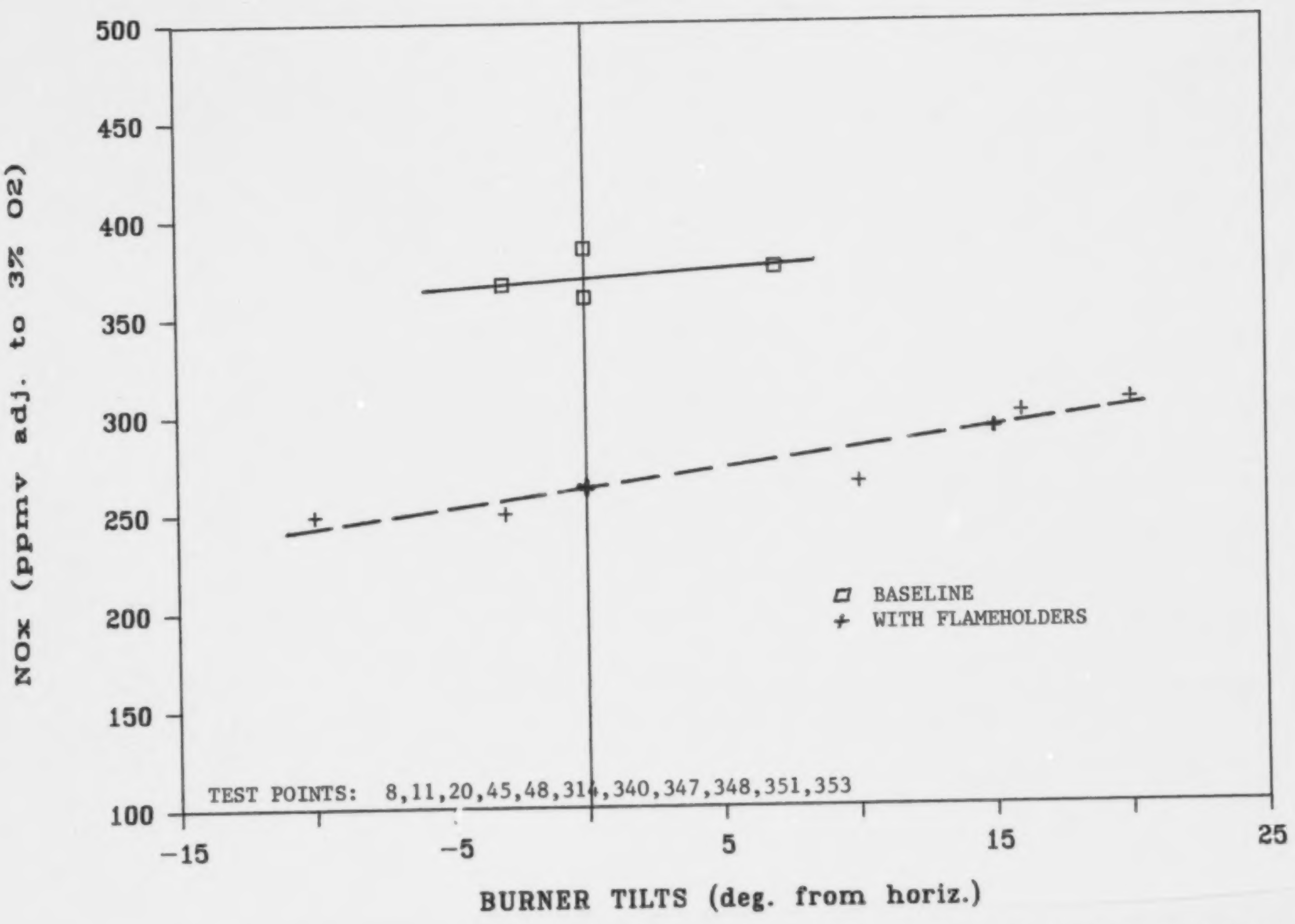


Figure 35. Post-modification burner tilts versus NO_X at full load, with overfire air, and excess oxygen levels between 3.5 and 4.5 percent.

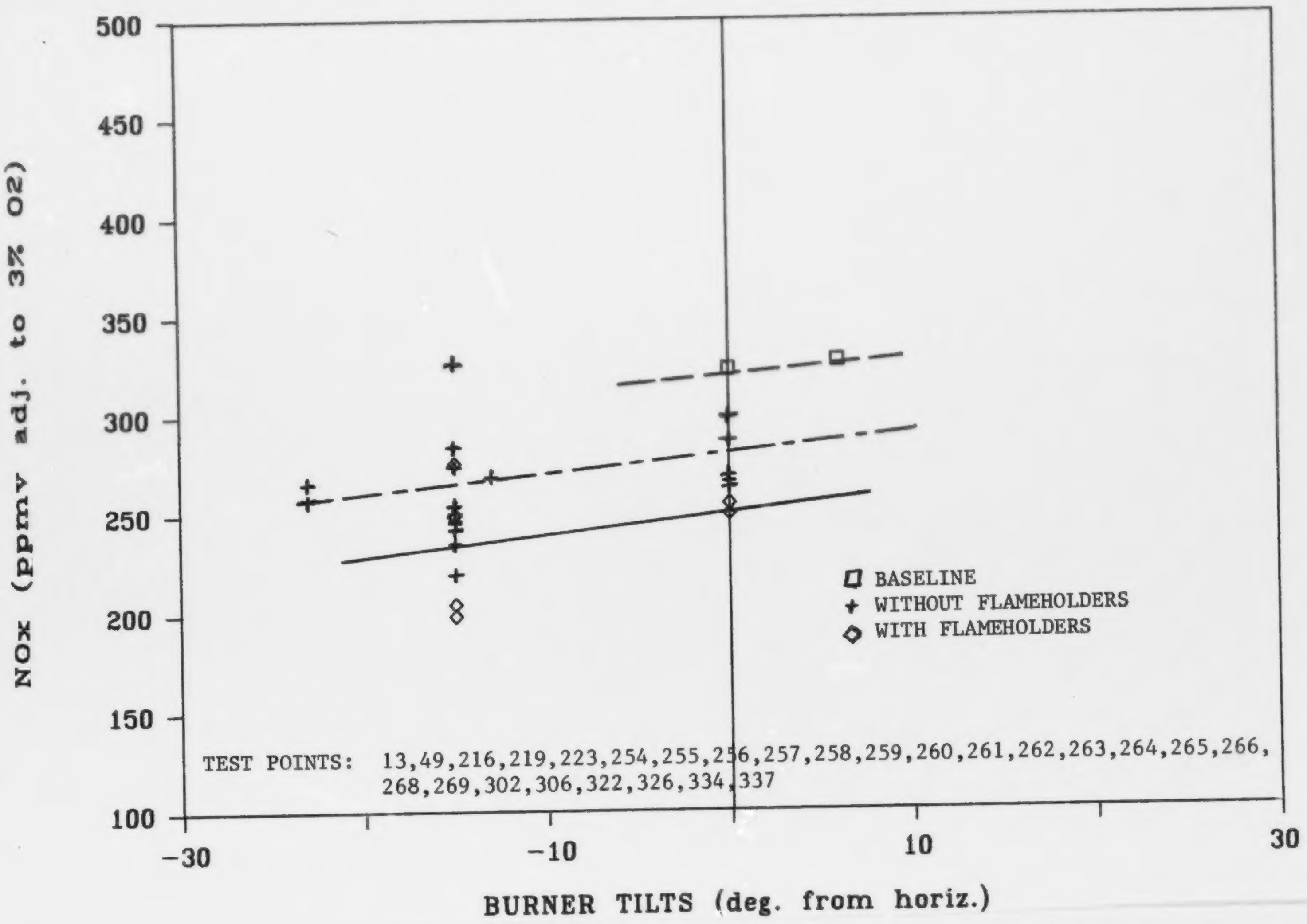


Figure 36. Post-modification burner tilts versus NO_x at full overfire air and load, uptilted overfire air, and excess oxygen between 3.5 and 4.5 percent.

This result appears to be further verifying the minimum NO_x threshold postulate stated previously. Additionally, the shallower slope of the raised overfire air tilt results versus the horizontal overfire air tilt results tend to substantiate this premise, also.

Again, NO_x levels of 200 ppmv (adj. to 3% 02) were shown with acceptable carbon monoxide levels (below 100 ppmv). But the testing showed that high CO levels were possible and therefore the overfire air tilts were set manually to a horizontal to plus five (+5°) degree range for the long-term thirty-day continuous emissions monitoring (CEM) tests.

Effect Of Fuel-Air Dampers On NO_x

The effect that the fuel compartment secondary air dampers have on NO_x emissions was analyzed during the second post-modification test series conducted during March, 1982. Four series of four tests were run with the fuel air dampers (FAD) modulating from 100% open, to 50% open, to 20% open and to 10% open. The results from these tests is shown in Figure 37. As shown, closure of the fuel air dampers had minimal effect on NO_x emissions when the overfire air dampers were open. This compares to the baseline result of approximately a 40 ppmv NO_x reduction for the baseline no overfire air case and 20 ppmv for the full OFA case. Additionally, the baseline results were for only a 50% FAD closure.

Based primarily on these minimal results the Second Generation low NO_x system was not analyzed for NO_x reductions by closing the fuel air dampers.

Effect Of Unit Load On NO_x

Boiler performance and emissions at partial loads were extensively tested as part of this program. This was done not only to complete the boiler characterization but also to generate a long-term low-load low-NO_x operating procedure. This procedure usage became standard during the latter phase of the program due to a lack of electric power demand.

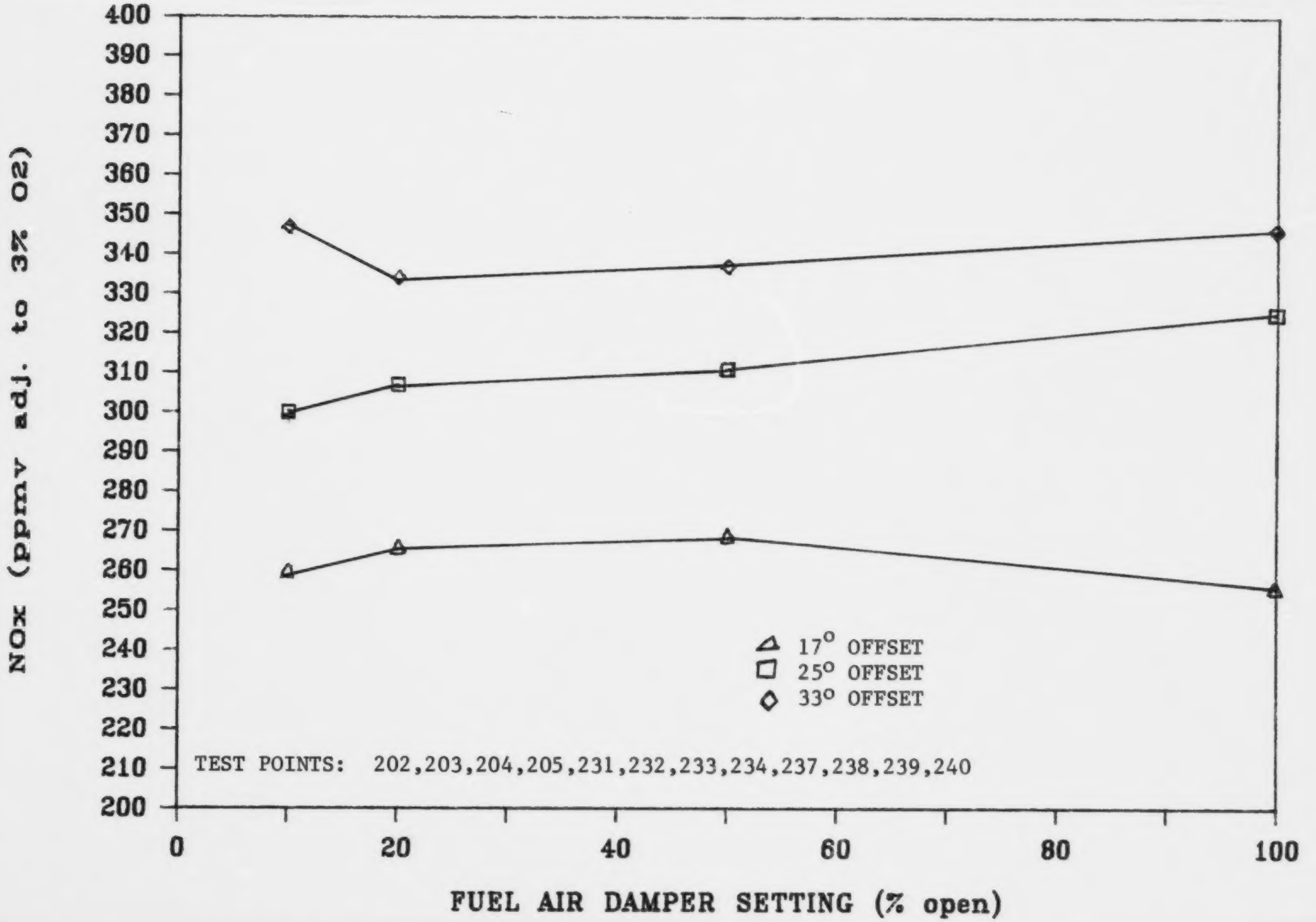


Figure 37. Post-modification NO_x versus fuel air damper settings at full load with various horizontal offsets examined.

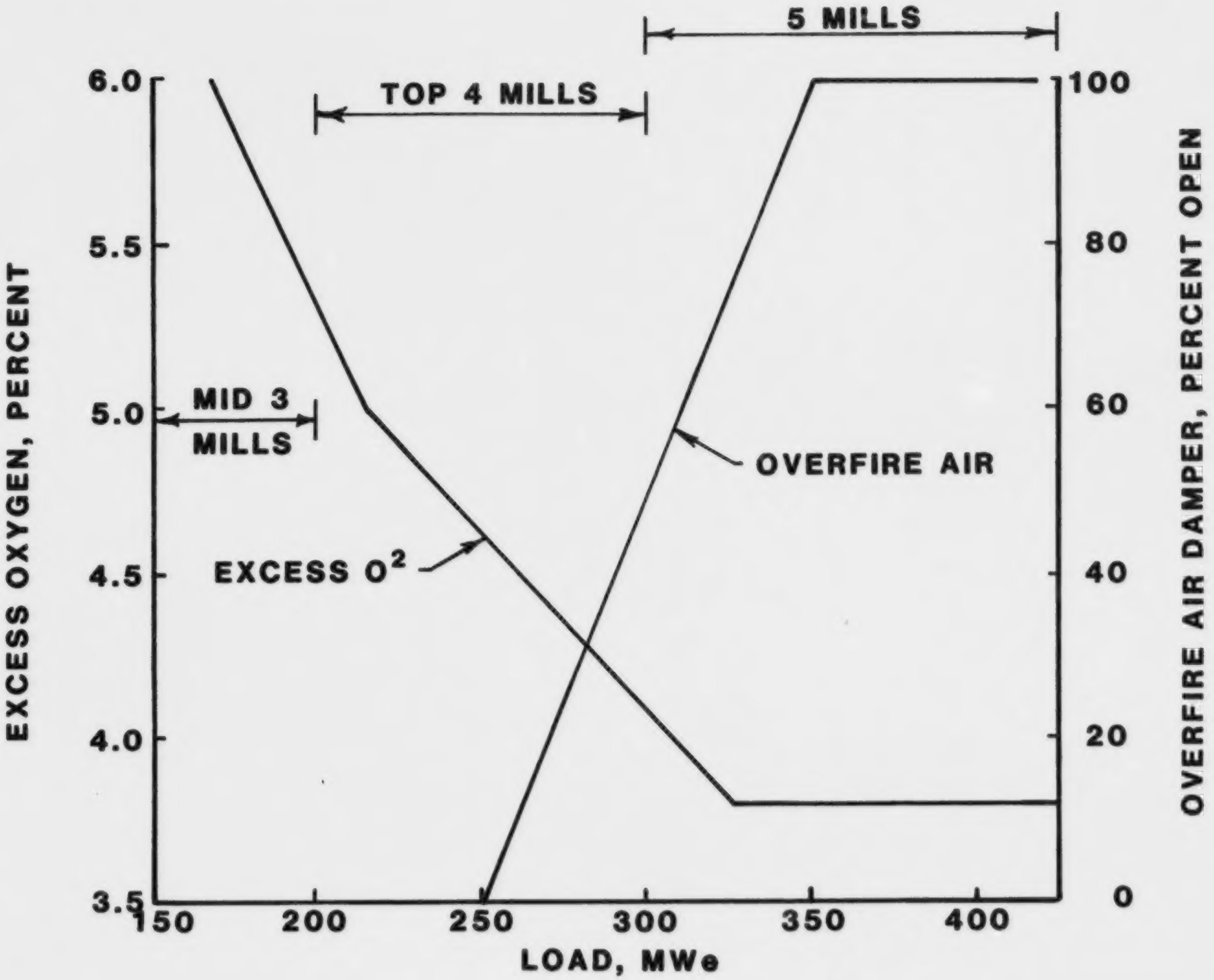


Figure 38. Ramp functions of load versus excess oxygen and overfire air at Hunter No. 2.

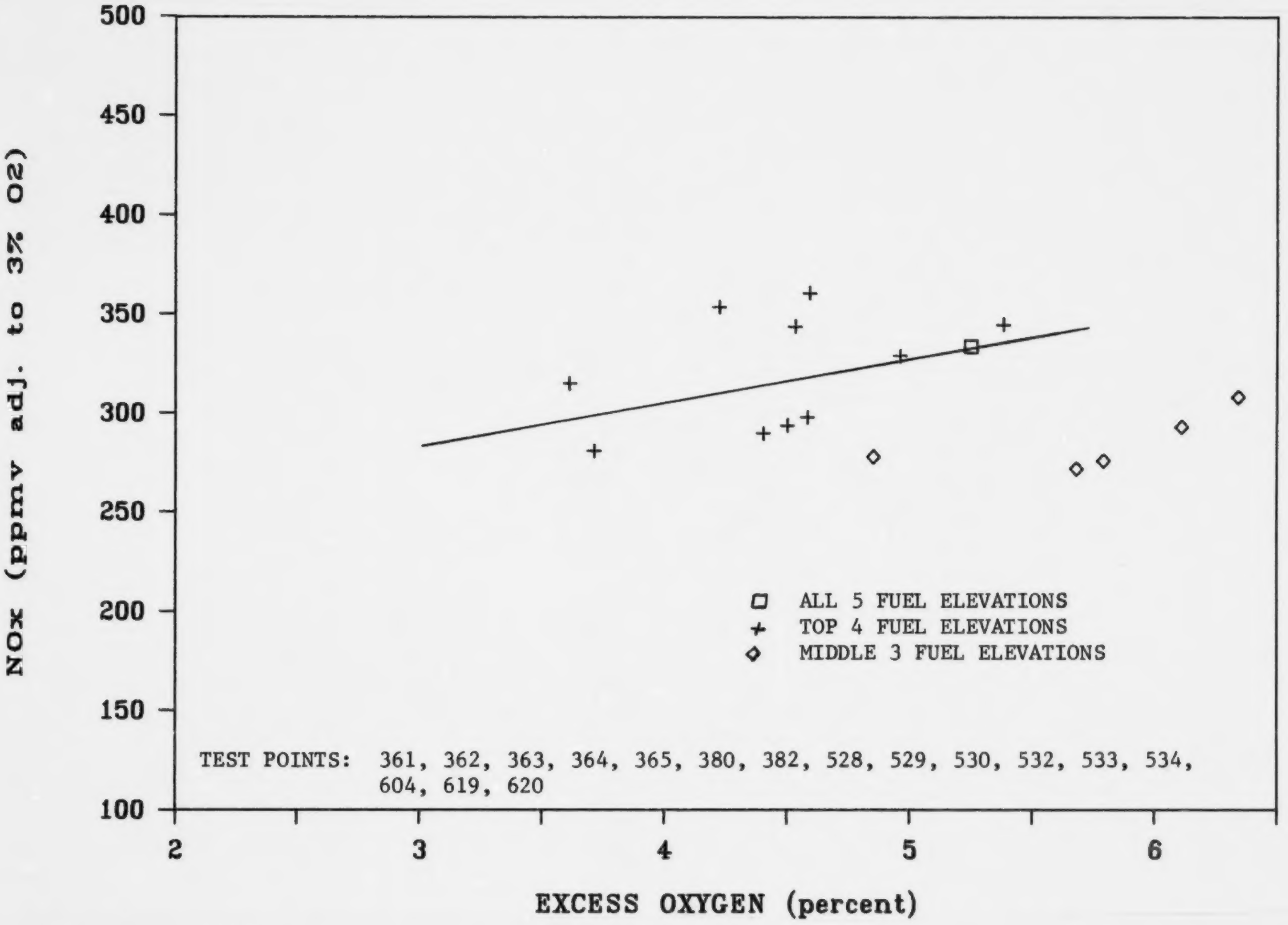


Figure 39. Post-modification NO_x versus excess oxygen at partial load, without overfire air and burner tilts greater than plus 15 degrees.

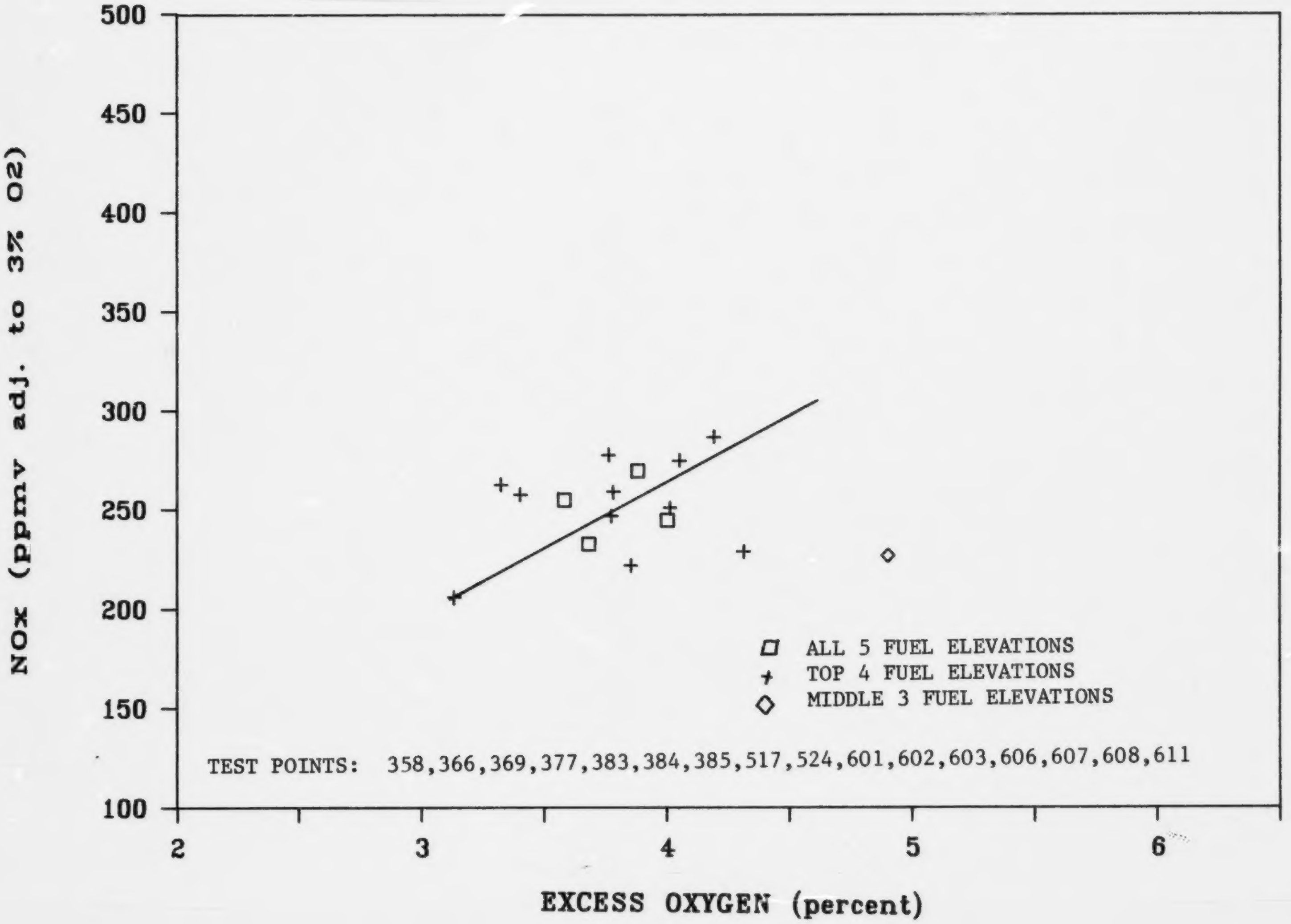


Figure 40. Post-modification NO_x versus excess oxygen at partial load, greater than 30% overfire air, overfire air tilts between -10 and +10 degrees, and burner tilts less than +10 degrees.

The analysis included boiler loads down to 200 MWe or one-half of the full load maximum continuous rating (MCR). The normal operating procedure calls for utilizing the middle three fuel elevations (or pulverizers) for loads below approximately 200 MWe. For loads between approximately 200 MWe and 300 MWe the top four fuel elevations are fired. And, for loads greater than 300 MWe all five fuel elevations are normally utilized. This procedure is shown in Figure 38 along with the operating procedures for the overfire air controls and the excess oxygen controls.

Figures 39 and 40 present the results of the reduced load NO_x emissions tests. As per the operating procedures stated previously the mid three mill tests are for tests at approximately 200 MWe; the top four mill tests were conducted at or below approximately 300 MWe; and the five mill tests were above 300 MWe.

As shown in both Figures 39 and 40 there is a great deal of emissions data scatter during reduced load operations. This is due to the system and operator flexibility. This flexibility is desirable to balance the varying operational requirements including maintenance of equipment, efficient operation and controlling steam and metal temperatures.

Comparison of Figure 39 with 32 or 40 with 33 show no discernable trends of changing NO_x with load. This is similar to the Baseline Characterization results. Additionally, reduced load with either all fuel elevations or the top four elevations appears to produce NO_x levels similar to full load. The mid three mill operational results do achieve similar NO_x emissions at higher excess oxygen levels. However, it could not be determined from the data if these results would translate to further NO_x reductions at reduced excess air flows.

Relating these results to actual operations (refer to Figure 37), it can be seen that at boiler loads of 280 MWe or above the NO_x emissions will be typical to those presented on Figure 40 (approximately 250 ppmv). For boiler loads below 280 MWe NO_x emissions values shown in Figure 39 would be more typical (approximately 325 ppmv).

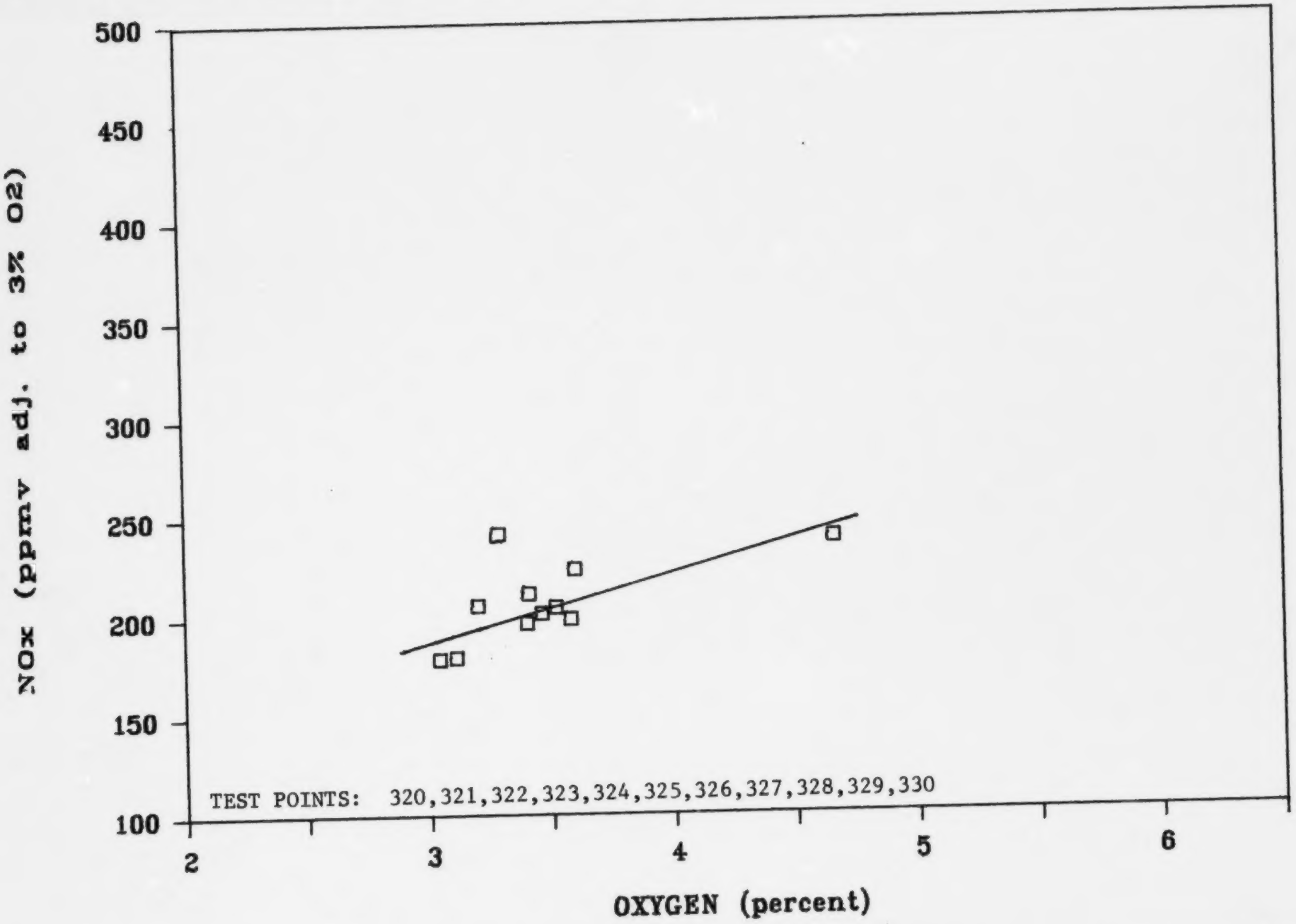


Figure 41. Post-modification NO_x versus excess oxygen at 370 to 380 MWe with full and uptilted overfire air.

These values were further verified during the long-term continuous emissions monitoring (CEM) tests shown in Part E of this report.

The testing did reveal an unexplained load related NO_x phenomena. That is, at approximately 370-380 MWe (approximately 90 percent of the nominal boiler rating) NO_x emissions were constantly lower than at any other load or condition. Figure 41 shows these results. They include several tests below 200 ppmv and a pair of tests at the 180 ppmv level.

III. BOILER PERFORMANCE AND RELATED EFFECTS

In addition to the board, computer and emissions data taken for every test, coal and flyash samples were taken for numerous tests. Analyses of these samples included proximate and ultimate analysis of the coal samples and carbon content in the flyash samples. Also, because of the extended time period that some operating parameters required to achieve steady-state conditions, reports from control board operators and the plant engineers were evaluated for performance changes.

There were five principal areas addressed in the boiler performance analysis. They included boiler efficiency, steam temperature control, carbon loss in the flyash, economizer oxygen levels, and low load operations. These areas were chosen either because of their importance to boiler operations or were effected to some degree by the installation of the low-NO_x firing system.

Boiler Efficiency

Figure 42 presents the results of the boiler efficiency analysis. The boiler efficiencies were determined utilizing a computer program which is based on the heat loss method of the ASME Power Test Code, Section 4.1. As shown in the figure, for similar excess air levels there appears to be no difference in boiler efficiency between the Baseline and Post-Modification results. Also apparent is the increase in efficiency due to the decrease in excess air predominantly caused by a reduction in the dry gas loss. There-

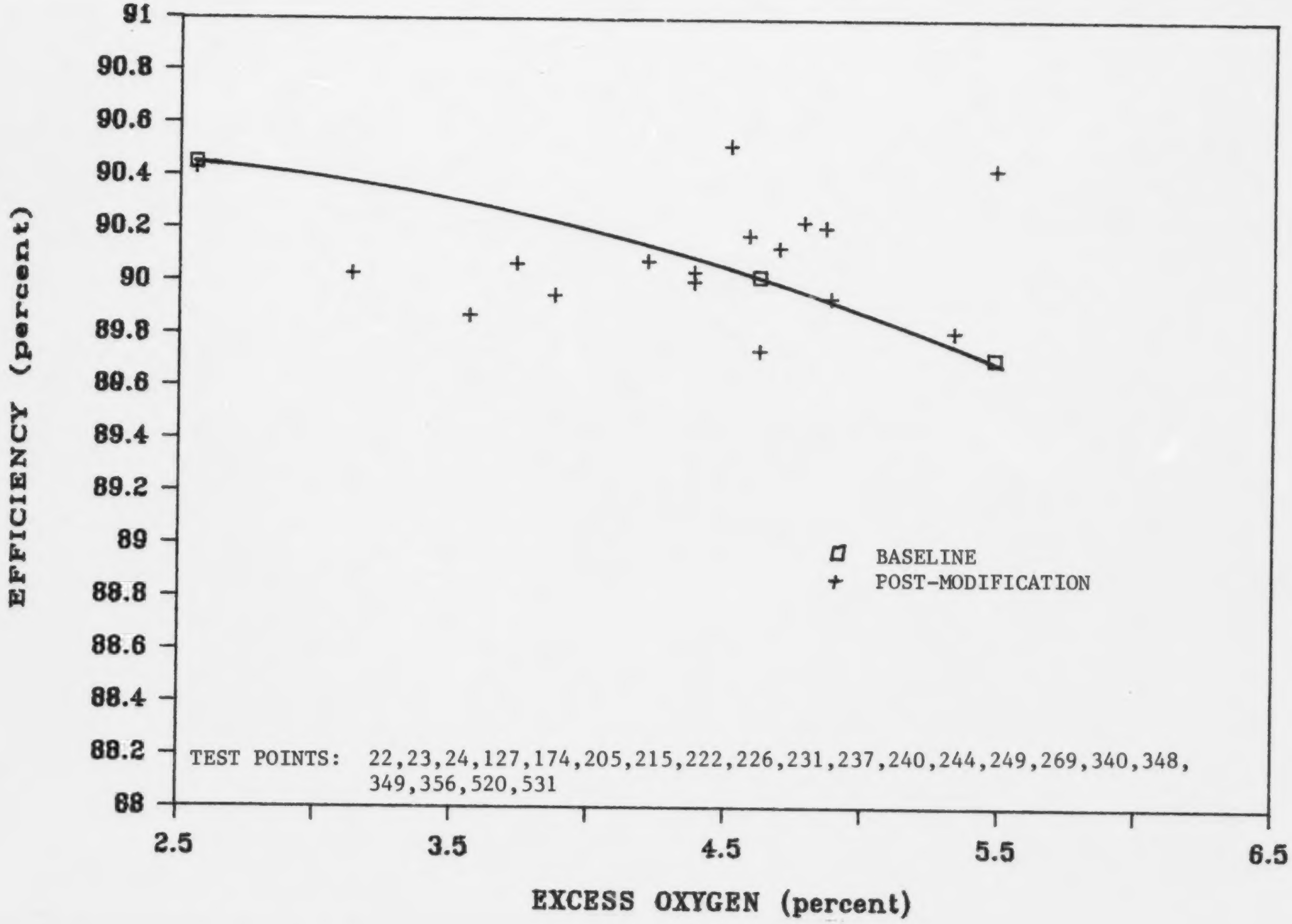


Figure 42. Boiler efficiency versus excess oxygen at Hunter No. 2.

fore, because the normal excess oxygen setpoint was decreased due to the test program (though not as a result of the low-NO_x system installation) the boiler efficiency has been improved. As stated previously in the excess air subsection, the normal excess oxygen setpoint had decreased from a baseline level of 4.0% O½ to a post-modification level of 3.0% O_2. (Operation with these set-points yielded excess oxygen levels of 4.5 - 5.0% O_2 and 3.5 - 4.0% O_2, respectively, due to trim effects).

Steam Temperature Control

Normal full load burner tilt levels to maintain design reheat outlet temperatures were approximately horizontal (after sootblowing) during the baseline testing. With the first configuration of the LNCFS the clean wall normal burner tilt levels had changed to approximately -10° to -15°. This level was based on long term operation as reported by the boiler operators and the field service engineer. This tilt change results in a decrease in the furnace outlet plane gas temperature (FOT) of approximately 40°F. Initially it was felt that this change was in response to a lengthening of the flame envelope caused by the staging of the combustion process or by increased recirculation and turbulence in the lower furnace. The first case could raise the FOT by shifting the char burning process higher in the furnace; the second case could raise the FOT by lowering the peak flame temperatures and "flattening" out the furnace heat absorption profile. It is currently felt that some combination of these two hypotheses contribute to a small change in the burner tilt with the major change being in response to a lowering of the excess air set-point previously discussed. (A lowering of the excess oxygen from 4.5% O_2 to 3.5% O_2 for the firing rates of this boiler would typically raise the FOT by approximately 30°F).

Upon installation of the flame holders the clean wall normal burner tilt level was again at horizontal. Thus, the cumulative effect of the LNCFS, flame holders, and reduced excess air on the burner tilts and FOT was negligible. The reason that the tilts increased upon installation of the flame holders has not been quantified but it is felt that the flame holders may have stabilized the ignition front more quickly and thus lowered the FOT as the flame envelope shifted downward.

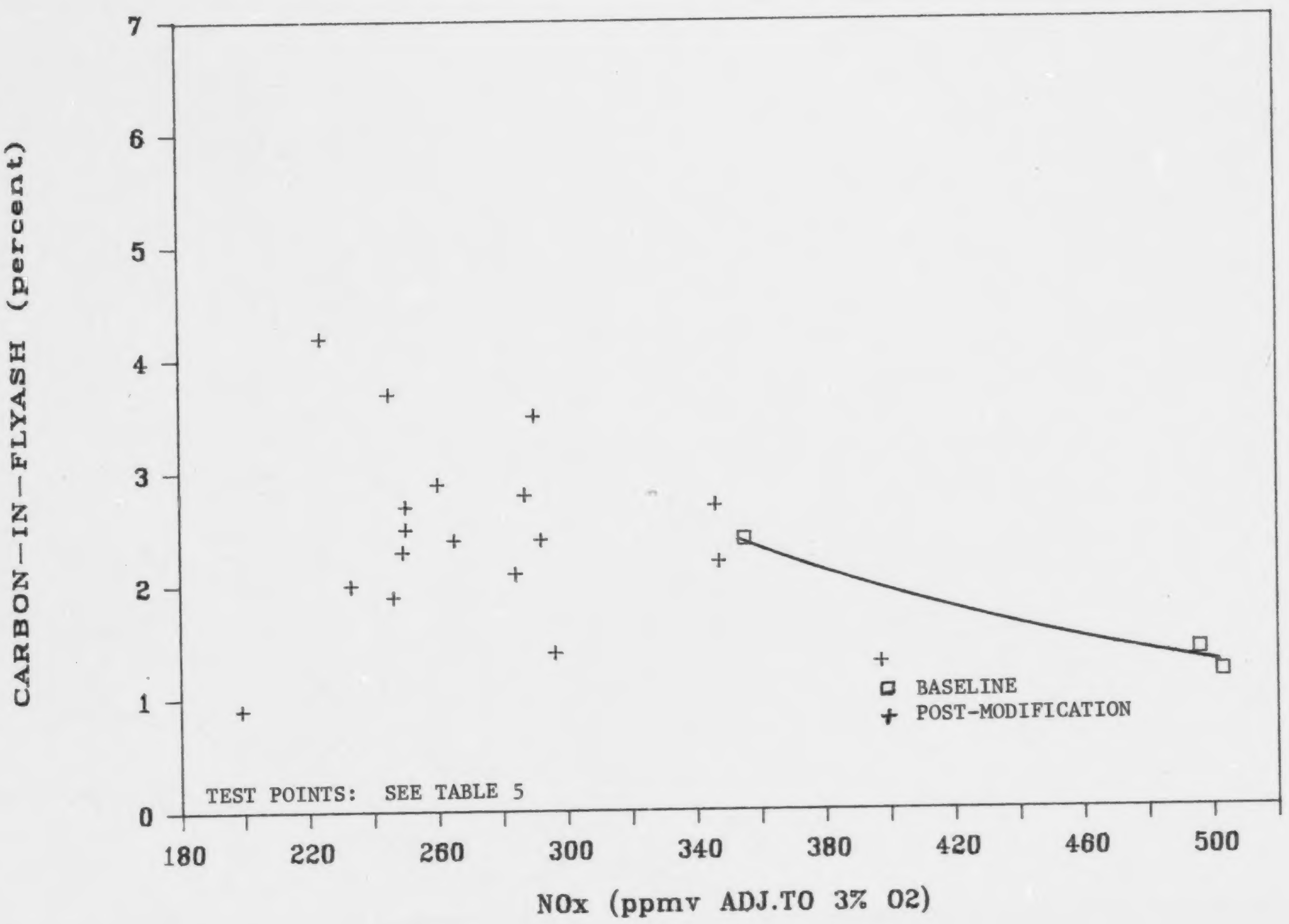


Figure 43. Baseline and post-modification full load carbon-in-flyash levels versus NO_x emissions.

The use of overfire air (OFA) with the second generation LNCFS does not appear to have a significant effect on the burner tilt or on either the superheater or reheater steam outlet temperatures (SHO and RHO). However, based on the results of previous studies it is anticipated that the local windbox waterwall heat absorption does increase with OFA. This is probably due to the more nearly stoichiometric conditions created in the windbox elevation with OFA.

Carbon In Flyash Levels

Several analyses were completed with the flyash carbon content results. Figures 43 and 44 present the results of these analyses. Figure 43 shows the effect of NO_x emissions levels on carbon-in-flyash. The results show a typical relationship of increasing carbon levels for lower NO_x levels. This relationship may be due to the staged combustion method of NO_x reduction.

For the NO_x levels achieved during the characterization tests the full load carbon-in-flyash levels were all below the 5.0% limit set by the utility because of flyash disposal requirements. Typically, the carbon levels ranged between 1.0% and 3.0%.

Several of the reduced load tests did show higher levels than the full load tests. This may be due to the decreased furnace temperatures and/or reduced gas mixing at reduced boiler loads. Table 5 presents the carbon-in-flyash results for all of the tests conducted during this program.

Figure 44 presents the carbon monoxide (CO) data for the carbon-in-fly tests. From these results there appears to be no trend or relationship between the CO value for a test and the carbon-in-flyash value. That is, several tests reported high CO levels with low carbon-in-flyash results and several had high carbon-in-flyash results with low CO levels.

Similarly, comparison of the carbon-in-flyash results to the excess oxygen level and to the overfire air tilt for the test range of oxygen (2.5% to 6.5%) presented no trends or relationships. This does not imply that a trend does not exist for excess air levels lower than the test range.

Thus, the first and second generation LNCFS have had a negligible effect on carbon-in-flyash levels. Also, coal and/or slagging variations may be the primary cause for the scatter of one to two percent in the carbon-in-flyash results.

Economizer Oxygen Levels

For each of the characterization tests a twelve (12) point flue gas sample was taken across the two unit air heater inlets. These point samples were then combined into four (4) probe assemblies arranged across the air heaters. During the testing it became apparent that an imbalance existed in the oxygen levels of these four probe assemblies.

TABLE 5

Carbon-In-Flyash Analysis

Test Number	Boiler Load (MWe gross)	Excess Oxygen (percent)	NO_x Emissions (ppmv adj to 3% O_2)	Carbon in Flyash (% by weight)	CO Emissions (ppmv adj to 3% O_2)
22	392	4.62	503	1.2	17
23	394	5.48	496	1.4	10
23	390	2.56	355	2.4	16
127	412	4.38	397	1.3	12
174	424	5.33	284	2.1	140
205	414	4.21	296	1.4	11
215	424	3.13	246	1.9	493
222	428	3.73	224	4.2	2793
226	416	4.88	245	3.7	894
231	417	4.38	287	2.8	31
237	420	4.58	346	2.7	45
240	415	4.86	347	2.2	16
244	411	4.69	280	3.5	860
249	410	4.78	260	2.9	217
269	420	4.51	257	2.0	31
322	377	3.58	199	0.9	64
340	423	3.56	292	2.4	84
348	417	3.87	265	2.4	144
349	417	3.82	249	2.3	62
362	428	3.20	233	2.0	118
353	404	4.11	250	2.7	61
356	360	3.14	250	2.5	474
520	430	3.77	280	2.0	29
531	186	6.37	308	3.4	26
534	273	4.53	344	3.7	31
535	321	3.76	305	5.0	36
536	317	3.55	287	6.0	27
537	314	3.11	251	4.9	31
538	314	3.39	265	5.4	22
539	310	3.06	212	4.4	55
540	313	2.84	198	3.4	169
605	313	3.79	319	3.0	23

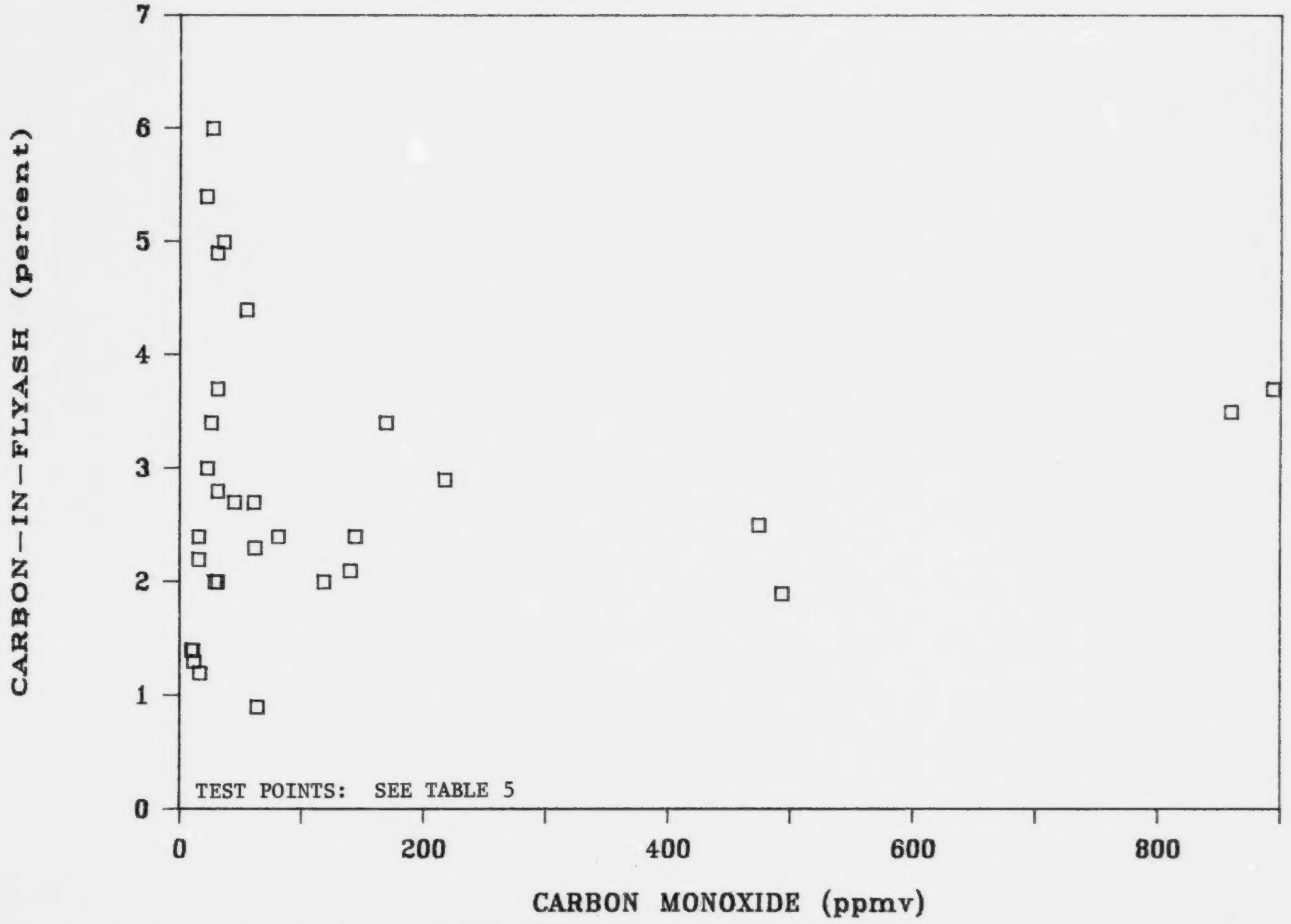


Figure 44. Carbon-in-flyash levels versus carbon monoxide (CO) for all flyash sample tests.

This imbalance could cause both an operational and a test problem. A test problem could be caused by a low 02/high CO value present in one probe skewing the otherwise normal results. The imbalance or differential in oxygen values would present an operational problem because the control system trims the combustion airflow to maintain the 3.0% 02 minimum setpoint. As such, imbalances would cause the average excess oxygen level to raise and thus decrease boiler efficiency.

It is currently felt that the imbalance may be caused by insufficient mixing of the fuel and combustion air in the furnace. During the low-NO_x program this situation was aggravated by further limiting the mixing by staging the combustion process. This includes limiting the fuel-air flow, having a large differential between the burner tilts and overfire air tilts, and to a smaller degree, offsetting the auxiliary air with the concentric firing system.

Observations made during both the short-term characterization and long term 30-day emissions testing have shown that the imbalance can be controlled at loads greater than 250 MWe in most instances by maintaining the difference between the overfire air tilts and burner tilt at approximately minus ten degrees (-10°). For example, if the overfire air tilts are at horizontal then the burner tilts should be approximately +10°. Operating under these conditions does compromise the NO_x reduction capability of the OFA by about 20 ppm, however, the stability achieved permits operation at lower excess air levels which will decrease NO_x and increase boiler efficiency. Also, as part of the final windbox modification before concluding the program, the fuel compartment free area was changed. For the test program the fuel-air free area was reduced to approximately 55% of the baseline design level. This was increased to approximately 80% of the baseline level in January, 1984. Verification testing during March of 1984 (test series 600-620) has shown that these two operating conditions minimize the oxygen imbalance.

Low Load Operation

Because this unit is currently in low demand in Utah Power and Light's power grid, low load stable operation is a benefit. Upon installation of the flame holders the ignition stability improved such that the boiler operators can maintain approximately 180 MWe without using expensive warm-up fuel. Operators have stated that previous to the modification they felt "comfortable" with the stability only to 200 MWe to 220 MWe. Note, however, that at loads below approximately 250-270 MWe the overfire air compartments are closed, the excess air starts to increase (to maintain steam temperatures), and the auxiliary compartments are nearly closed. This operation nullifies the NO_x reduction techniques and thus NO_x levels of 340-360 ppm (adjusted to 3% O_2) are common at 220 MWe and 40% excess air.

Effectiveness Of Concentric Firing

The offset firing system was evaluated with and without overfire air and at offset angles from 8° to 33° during characterization testing of this program. As Figure 32 showed, the offset firing system had a minimal effect on NO_x emissions when overfire air was not used. This effect was typical to all offset angles. However, when firing with overfire air NO_x was reduced approximately an additional 40 ppmv to 50 ppmv with offset firing (seen in Figure 33). Again, there appeared to be little difference in the NO_x results as the offset angle was changed. Therefore, for NO_x reduction in the relatively slow mixing of tangential firing the bulk lower furnace stoichiometry and the stable ignition point location have a higher degree of importance than the local stoichiometry created by offset firing alone. However, local stoichiometry does have a small effect on NO_x (approximately 8% to 10%) when used in conjunction with reduced lower furnace bulk stoichiometry (i.e., overfire air).

It is interesting to note that these results are in contrast to the pilot scale and small boiler field test programs. This may be due to the interdependence and interaction of fuel elevations in a large utility boiler. It also may be due to the minimal effect that this offset system has on the low slagging, low iron coal fired at this unit.

IV. POST MODIFICATION CHARACTERIZATION CONCLUSIONS

During the post modification characterization NO_x emissions levels of 200 ppmv to 220 ppmv were achieved at full load, full OFA and the OFA uptilted. This level was also achieved repeatedly for boiler loads between 370 MWe and 380 MWe which appears to be the optimum boiler load condition for achieving low-NO_x emissions. With horizontal overfire air tilts, which is recommended for long term operations, NO_x emissions levels of 250 ppmv are more typical. Operating without overfire air yielded NO_x emissions of 300 ppmv for the second generation low-NO_x firing system with the flame holders. For the first generation low-NO_x system, operations without overfire air did not appear to reduce NO_x emissions below the baseline level of 375 ppmv to 400 ppmv at 3.0% excess oxygen.

Breaking out the individual parameters for their effects on NO_x emissions from the baseline normal operating level of 450 to 460 ppmv yields the following conclusions:

- Reducing the excess oxygen operating level from 4.5% - 5.0% to 3.5% -4.0% yields NO_x reductions of approximately 65 ppmv or fourteen (14) percent of the baseline level.

- Utilizing overfire air (OFA) with horizontal OFA tilts reduces NO_x emissions an additional 80 ppmv or approximately eighteen (18) percent of the baseline level.

- Stabilizing the ignition front closer to the burner by utilizing the flame holders reduces NO_x emissions by approximately 50 ppmv or eleven (11) percent from the baseline level.

- And finally, utilization of the offset firing system in conjunction with overfire air reduced NO_x emissions an additional 50 ppmv (11 [illegible]rcent) beyond the overfire air levels.

The results have also shown that there may be a lower limit for the NO_x emissions for the test unit configuration, fuel type, and fuel system design. It appears that this low threshold is at approximately 170 ppmv to 180 ppmv.

For long term operation with efficient boiler conditions, a full load NO_x level of approximately 240 ppmv to 260 ppmv is predicted. For reduced load operations, a NO_x level of 320 ppmv to 350 ppmv would be more typical because of reduced overfire air and increased excess air.

With respect to boiler performance, there appears to be no significant changes between the baseline and the post-modification operation. Reduced excess air levels have slightly improved boiler efficiency and the flame holders appear to have improved low load ignition stabilization. But steam temperature control and carbon-in-flyash levels have been unchanged for normal operating conditions.

In addition, it has been determined that operations which create a high degree of combustion staging may potentially cause inefficient operations with high carbon monoxide levels and increased excess air flow. Examples of these deep staging conditions include minimizing the fuel-air flow and/or maintaining a large differential between the burner and overfire air tilts.

This demonstration program has shown that the low-NO_x Concentric Firing System with flame holders can significantly reduce NO_x emissions in tangential coal-firing utility boilers. It has also shown that the system is easily retrofittable and that the NO_x reductions are not at the expense of decreased unit performance.

PART E

THIRTY-DAY CONTINUOUS FLUE-GAS EMISSIONS MONITORING

The 30-day continuous emissions monitoring (CEM) system was employed four (4) times during the low-NO_x test program. Flue gas emissions of NO_x , O_2, CO, and CO_2 were monitored continuously and logged on 15-minute intervals throughout the tests. The principal goal of these tests was to provide an overall determination of flue gas emissions during normal boiler load cycling over an extended period. These results would better quantify the emissions for normal boiler operating condition than the short-term closely scrutinized characterization tests. A second goal of these CEM tests was to provide the EPA with performance, reliability and operating experience for the continuous emissions monitoring system. This goal was achieved by conducting periodic measurements of drift, accuracy, precision (repeatability) and response time.

This testing was conducted by KVB, Inc. under subcontract to Exxon Research and Engineering (ER&E). A summary of the test results is reported here. Detailed results of this work including the EPA instrument performance test results, the daily averages for the emissions and the load, and the statistical analyses are available in ER&E's project report. The report was done for EPA Contract No. 68-02-2696 and is titled Long Term Optimum Performance/Corrosion Tests of Combustion Modifications for Utility Boilers - Host Site: Utah Power and Light Company Hunter No. 2.

The four test periods for the Hunter No. 2 boiler were Oct.-Dec. 1982, April-May 1983, June-July 1983, and July-Aug. 1983. Table 6 summarizes the results of the four periods. The load (MWe), oxygen (02) and NO_x (lb/MBtu) are of specific interest.

The mean loads for the four periods were between 270 and 290 MWe. This represents only approximately seventy percent (70%) of the design full load rating. And, as pointed out in Sections C and D of the report, reduced load operations reduce the effectiveness of several NO_x reduction techniques. Specifically, reductions in overfire air, auxiliary (offset) air and increases in excess air are initiated at loads below 300 MWe.

The first test had a mean excess air level of 5.9% O_2 and a mean NO_x level of 0.43 lb/MBtu. For this test the low NO_x operating procedure including the low excess air operation had just been initiated and the boiler operators were not strictly following the newly recommended procedures. For the second test the mean excess air level dropped significantly to 3.8% O_2 and the NO_x level dropped slightly to 0.41 lb/MBtu.

For the third series the boiler operation was closely monitored by C-E and ER&E personnel. The purpose of this monitoring was to determine if NO_x emissions could be further lowered by assuring that the recommended operating procedures were being closely followed. Also, although the UP&L boiler operators were following the recommended procedures, the close monitoring allowed for "fine tuning" of the recommended procedures on a day-to-day load basis. This monitoring resulted in the lowest mean excess oxygen level, 3.25% 02, and the lowest mean NO_x level, 0.38 lb/MBtu.

For the fourth series normal monitoring was resumed. This resulted in a mean NO_x emission level of 0.42 lb/MBtu at a mean excess oxygen level of 3.9% O_2. The similar results between test series 2 and 4 show that for normal operations a level of 0.41-0.42 lb/MBtu for NO_x emissions and 3.8-3.9% O_2 for excess oxygen is probable for this long-term mean three-quarter load point.

CONTINUOUS EMISSIONS MONITORING CONCLUSIONS

NO_x emissions for this unit average approximately 0.41 lb/MBtu for a thirty-day rolling average when firing under normal low-NO_x operations. The mean load for this result is approximately 70% of the unit design rating. This result also exhibits the difference between short-term controlled characterization tests (NO_x levels down to 0.3 lb/MBtu) and long-term normal operations.

The recommended low NO_x operating procedures appear to produce slightly better boiler performance and efficiency. This is shown by comparison of the oxygen (O2) levels and the carbon monoxide (CO) levels of the first test with the remaining three tests. The excess oxygen was cut by at least two percent in all cases and the carbon monoxide was cut in half for all tests.

Finally, the extractive type continuous emissions monitors used in these tests were able to meet the EPA performance specifications. However, periodic maintenance and calibration was needed to insure continued high quality data.

TABLE 6 (pg 1 of 2)

STATISTICAL PARAMETERS FOR HUNTER UNIT NO. 2
30 DAY FIELD TESTS

FIRST 30-DAY TEST

	Load (MW_{th})	Load (MW_e)	O_2 (%)	CO_2 (%)	CO (ng/J)	NO* (ng/J)	NO* (lb/MBtu)
Minimum	437.5	200.0	3.5	12.2	3	146	0.19
Maximum	736.3	361.7	7.6	18.1	51	239	0.56
Mean	600.4	291.6	5.9	14.5	22	186	0.43
Variance = $(SD)^2$	10733.0	2695.7	1.695	2.90	235.52	614.05	0.004
Standard Deviation (SD)	103.6	51.92	1.302	1.703	15.347	24.78	0.06
Count	29	30	30	30	30	30	30
Percent Deviation	17.3	18.0	22.1	11.7	69.8	13.3	14.0

SECOND 30-DAY TEST

	Boiler Load (MW_{th})	Elec. Load (MW_e)	O_2 (%)	CO_2 (%)	CO (ng/J)	NO* (ng/J)	NO* (lb/MBtu)
Minimum	538.7	256.1	2.9	14.5	8	163	0.38
Maximum	749.5	333.7	5.4	17.1	22	196	0.46
Mean	600.5	288.8	3.8	16.3	11	177	0.41
Variance = $(SD)^2$	1536	258	0.28	0.36	9.3	64.6	0.0004
Standard Deviation (SD)	39.2	16.1	0.53	0.60	3.0	8.0	0.02
Count	30	30	30	30	30	30	30
Percent Deviation	6.5	5.6	14.0	3.7	28.3	4.6	4.6

*NO mass emission rates are in terms of NO_2.

TABLE 6 (pg 2 of 2)

STATISTICAL PARAMETERS FOR HUNTER UNIT NO. 2
30 DAY FIELD TESTS

THIRD 30-DAY TEST

	Boiler Load (MW_{th})	Elec. Load (MW_e)	O_2 (%)	CO_2 (%)	CO (ng/J)	NO* (ng/J)	NO* (lb/MBtu)
Minimum	544.5	231.8	2.4	15.7	6	147	0.34
Maximum	634.3	299.9	4.3	17.5	16	183	0.43
Mean	587.3	273.12	3.25	16.4	7	163	0.38
Variance = $(SD)^2$	622.0	273	0.24	0.28	4.5	56.5	0.0004
Standard deviation (SD)	24.9	16.5	0.48	0.52	2.1	7.5	0.02
Count	30	30	30	21	30	30	30
Percent Deviation	4.2	6.0	14.9	3.2	30.3	4.6	4.6

FOURTH 30-DAY TEST

	Boiler Load (MW_{th})	Elec. Load (MW_e)	O_2 (%)	CO_2 (%)	CO (ng/J)	NO* (ng/J)	NO* (lb/MBtu)
Minimum	479.9	230.3	2.8	14.2	8	150	0.35
Maximum	663.8	347.9	5.1	17.1	16	210	0.49
Mean	577.4	271.4	3.9	15.8	10	179	0.42
Variance = $(SD)^2$	2142	679	0.39	0.61	4.0	239.3	0.0013
Standard Deviation (SD)	46.3	26.1	0.62	0.78	2.0	15.5	0.04
Count	30	30	30	30	30	30	30
Percent Deviation	8.0	9.6	16.2	5.0	19.9	8.6	8.6

*NO on a mass basis is in terms of NO_2.

PART F

CORROSION TESTING

I. INTRODUCTION

While achieving low-NO_x boiler operations was the primary goal of this program it was also necessary to determine how other boiler performance parameters were effected. This parametric evaluation was done principally with the characterization and 30-day test series, however, the longer term effects required other evaluation procedures. The boiler slagging and fouling performance was monitored by the boiler operators. And, the waterwall corrosion was determined by waterwall probes and ultrasonic tube-wall-thickness measurements.

The reason for monitoring waterwall corrosion during this program was that it had been theorized that the conditions which are conducive to low-NO_x also promulgate waterwall corrosion. That is, staged combustion low-NO_x techniques, in general, tend to create a reducing (oxygen depleted) atmosphere near the waterwall tubes. It was theorized that these reducing conditions might cause selective oxygen depletion from the waterwall steel and increase the waterwall corrosion rate.

The design of the Low-NO_x Concentric Firing System (LNCFS) minimizes the reducing atmosphere concern by creating a protective curtain of air along the waterwalls. Thus, it was necessary to compare the corrosion rates on this low NO_x boiler with other more normal designs. The test program conducted at Hunter No. 2 was designed to permit this boiler-to-boiler comparison.

Section B of this report, Data Acquisition and Testing Methodology, describes the three methods utilized to derive the corrosion data, that is, corrosion probes, ultrasonic thickness (UT) measurements, and furnace gas taps.

The UT method is the most accurate because it is a direct tube thickness measurement method, however, it is also the most costly and time consuming. For the corrosion probe method, the corrosion rate decreased as the exposure time increased, and thus, as expected, approached the UT-measured actual rate. However, since the probe method only approached the UT-derived corrosion rate, the probe data is useful only for qualitative comparisons or for probe test coupon material-to-material evaluations.

The furnace gas tap measurements were taken both to quantify the gaseous environment near the waterwalls and to ascertain the effectiveness of the LNCFS in blanketing the walls with air.

II. RESULTS AND DISCUSSION OF CORROSION TESTS

Ultrasonic Thickness Tests

Nearly 600 points were measured per outage for wall thickness at both the start and finish of program (Sept. 1981, Feb. 1984). This included measurements on all four walls at six distinct elevations (see Figure 19 in Section B). Elevation and boiler summaries of the results are shown in Table 7.

There appears to be a general trend of slightly thinner tube walls as one moves higher in the furnace. That is, the "F" elevation summary shows thicknesses of about 5 to 7 mils (0.005 to 0.007 inches) less than the "A" elevation summary. These elevation summary averages are derived from 90 or more points each. Therefore, there is a statistical significance to this 5 mil differential in tube thickness. This result may be due to higher gas temperatures in the upper furnace compared to the hopper region (especially along the walls) or it may be due to a more inert gaseous environment being present in the hopper region. This result may also be an erosion phenomena rather than corrosion. The erosion being caused by a greater amount of ash and particulates in the upper furnace and/or higher gas velocities. Regardless of the cause, 5 mils (0.005 inches) represents a very minute difference and will not impact the performance or longevity of the boiler walls.

TABLE 7

SUMMARY OF ALL THICKNESS MEASUREMENTS MADE EXACTLY ON THE ELEVATION CHALK LINES

All Values are in Mils (1 mil = 0.001 inch)

Elevation	Date of Measurement		Loss
	Sept, 1981	February, 1984	
A (Hopper)	245.02	244.94	0.08
B	245.80	243.70	2.10
C	243.72	242.06	1.66
D	243.05	240.54	2.51
E	240.33	240.78	-0.45
F (Just Below Nose)	240.85	237.75	3.10
Whole Boiler Average	243.06	241.53	1.53

Table 7 also shows that on the average, the wastage or loss rate is larger for higher elevations in the furnace. (The negative value for the material loss on level E appears to be caused by low readings on a few tubes during the September, 1981 measurement. Had it not been for these anomalies, the data would have fit the trend that seems to be indicated by the other values.) This increase in material loss for higher elevations further confirms the previous result of slightly thinner tubes for the upper levels.

The amount of the material loss, 3.10 mils for the worst case Level F and 1.53 mils for the whole boiler average, is representative of two (2) years worth of material loss, Sept. 1981 to Feb. 1984. (Though this is more two years time it only represents two years of boiler operation due to outages). Therefore, these losses represented on a rate basis are 1.5 mils per year (MPY) and 0.75 MPY for the worst case and boiler average, respectively. These wastage rates are very low and will not impact the 30-year design life of the boiler.

In addition to the elevation averages and boiler averages, the data was analyzed for any areas where high wastage rates might be expected. This analysis showed no areas of greater than a 2 MPY wastage rate. This highest area was proximate to the corner windboxes just downstream of the fuel and air burner jets. It was also seen that no area of the furnace had unacceptably high corrosion rates.

Therefore, operating under low-NO_x conditions with the concentric firing system (LNCFS) will not effect waterwall wastage rates detrimentally. Also, on the average the boiler corrosion rate was about 3/4 MPY (0.0075 inches per year) with no area in the boiler showing unacceptably high corrosion rates.

Corrosion Probe Tests

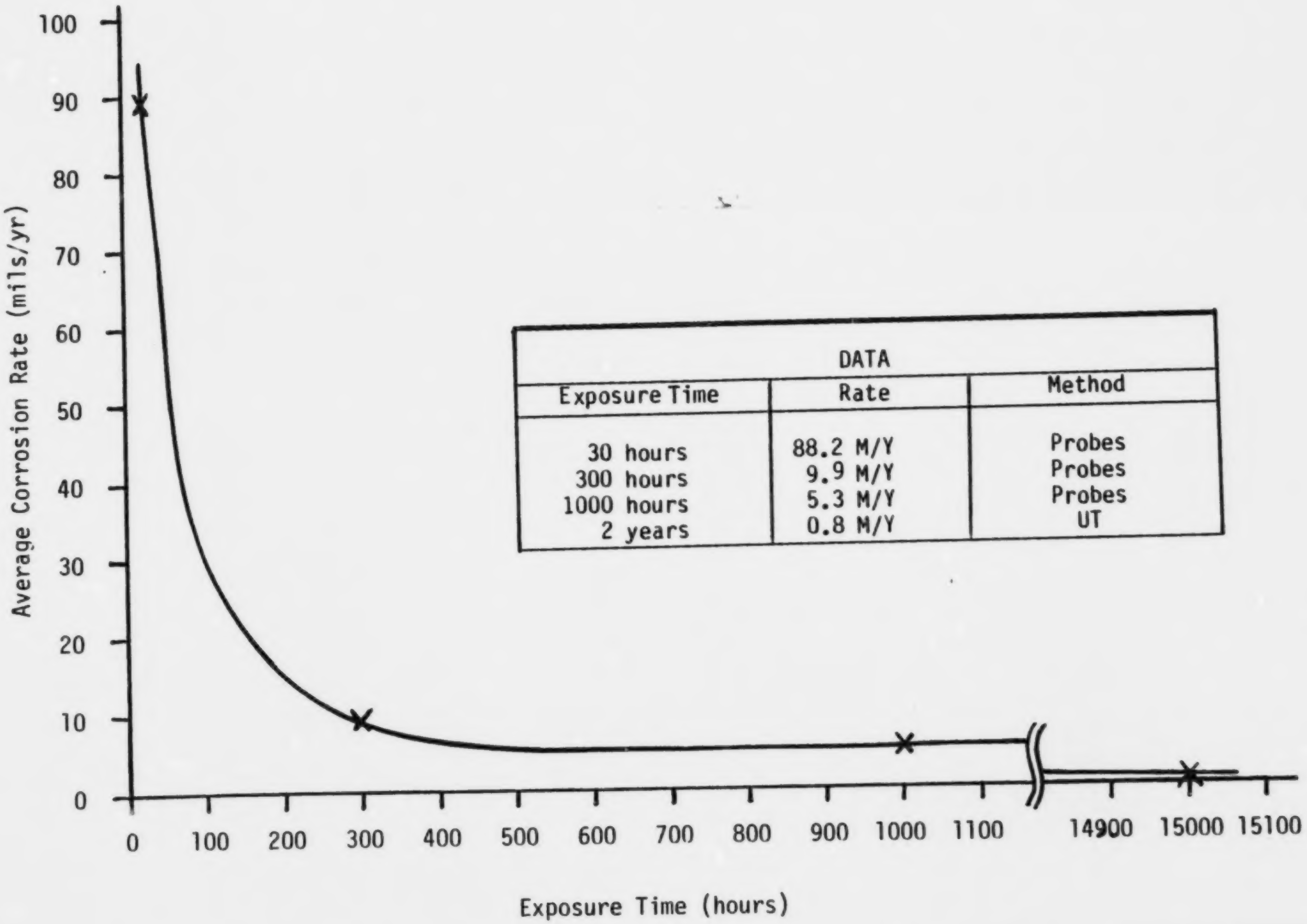
This program had three corrosion probe tests. Each test utilized five waterwall probes and each probe consisted of five test material coupons. Each of the three tests had a set duration; the first, 30 hours; the second, 300 hours; and the third, 1000 hours. The probe locations in the waterwalls were shown in Figure 19 Part B.

After each test period the probes were packaged and sent to Combustion Engineering, Inc for metallurgical analysis. This analysis included slag deposit examination, metal weight loss and micrometer wall thickness measurements. For each test this analysis was completed on each of the five material test rings or coupons for each of the five probes.

These studies confirmed the ultrasonic thickness results previously reported. That is, waterwall wastage rates have not been accelerated by operating under low-NO_x firing conditions. The results showed, as expected, that the wastage rates for the 30 hour test were significantly higher than for the 300 hour test. And, the 300 hour tests had a wastage rate approximately twice that of the 1,000 hour test. The results also confirmed that the corrosion probe method, even with 1,000 hours of exposure time, present corrosion rates more than six (6) times higher than the actual measurements derived with the ultrasonic wall thickness measurement method. Figure 45 presents summary results from each of the probe tests and the boiler summary results from the UT test. This figure has been excerpted from the ER&E report. The actual coupon material loss and the loss rate calculations (material density, exposed area, exposure time, etc) have not been reshown in this report.

One difference between the corrosion probe test results and the UT test results was that on an elevation basis the probe results did not show differing wastage rates. A possible explanation for this is that, at most, two probe assemblies were located at one boiler elevation and only five probes were utilized for the whole furnace. This compares to the UT method which had nearly 600 total furnace measurements per test and approximately 100 per elevation.

Analysis of the deposits (slag) that had built up on the test probe coupons did not reveal any sulfur compounds typically associated with waterwall wastage (pyrosulfates or sulfides). The X-ray difraction examinations revealed iron oxides and silica to be the main deposit compounds. Insignificant concentrations of corrosion by-products were found in all the analyzed deposits. Complete analyses of the deposit examination tests are shown in the ER&E final project report for EPA Contract No. 68-02-2696.



DATA		
Exposure Time	Rate	Method
30 hours	88.2 M/Y	Probes
300 hours	9.9 M/Y	Probes
1000 hours	5.3 M/Y	Probes
2 years	0.8 M/Y	UT

Figure 45. Furnace waterwall corrosion rate versus probe exposure time and two-year ultrasonic thickness test measured rate.

As stated above, each of the test probes contained five test rings. Two of the test rings were fabricated from 2-1/4% chromium-molybdenum type T-22 steel. One of the three T-22 test rings on each probe also had a protective surface coating. The two protective coating types used were Hastelloy C-276 spray coating and diffusion process chromizing. A comparison of the SA-210 and the T-22 steel results is shown in Table 8.

Summarizing Table 8, the T-22 material appears to have a much greater initial material loss than the SA-210 but after that initial loss the T-22 wastage rate appears lower than the SA-210. This conclusion was reached by comparing the 30-hour weight loss rates to the 1000-hour loss rates. The 1000-hour loss rates are approximately the same (comparing non-overheated samples) for the two materials but the 1000-hour to 30-hour loss ratio for the T-22 is only approximately 1.6 while the same ratio for the SA-210 is approximately 2.5.

A potential reason for this material loss phenomena is that in both cases mill scale is lost very quickly (less than 30-hours). The mill scale on the T-22 may be slightly greater than the SA-210. This would yield slightly greater short term losses for the T-22 than the SA-210. Then, upon removal of the scale, a protective coating forms on the tubes (sometimes called "seasoning") inhibiting further material loss. From the results, either the T-22 base material or its protective coating appears to be marginally better at inhibiting material loss than the SA-210. A test of even longer duration than the 1000-hours conducted in this program may be required to fully quantify this material difference.

The pre-test material coatings of Hastelloy C-276 or diffusion chrome plating did not appear to reduce the material loss. The ER&E report presents these results in detail but in general the coated test rings have either similar or greater material loss than the non-coated rings. The greater material loss appeared to have been caused by a spalling of the coatings.

TABLE 8
MATERIAL AVERAGE WEIGHT LOSS AND MAXIMUM MEASURED WALL THICKNESS LOSS

Exposure Time and Location	Weight Loss (mg/cm^2)		Maximum Penetration (inches) (Based on Micrometer Measurements)	
	Material		Material	
	SA-210	T-22	SA-210	T-22
30-Hour				
5th floor	5.5	8.1	0.001	0.001
7th floor front	1.7	7.9	0.001	0.001
7th floor rear	5.4	9.4	0.001	0.001
9th floor	5.2	5.4	0.001	0.001
10th floor	6.1	7.7	0.001	0.001
300-Hour				
5th floor	7.0	8.0	0.001	0.001
7th floor front	7.0	4.9	0.001	0.002
7th floor rear	3.9	8.8	0.001	0.001
*9th floor	3.3	8.6	0.001	0.001
*10th floor	6.7	10.0	0.001	0.001
1000-Hour				
**5th floor	12.3	11.2	0.001	0.001
+++7th floor front	107.5	106.0	0.005	0.005
7th floor rear	12.1	13.7	0.001	0.001
**9th floor	10.9	13.8	0.001	0.001
10th floor	11.8	10.7	0.001	0.001

*Short-term high-temperature excursions. (800°-850°F for <1 hour. Not considered to have affected results much.)

**Short-term elevated temperatures.

+++Overheated (16 hours without cooling air).

The micrometer analysis of the probes is also presented in Table 8. These measurements showed that the average wall losses in all cases were less than 0.001 inches. The similar small penetration between the 30-hour tests and the 1000-hour tests indicated a general attack. A large penetration and only slight material loss usually indicates pitting.

Gas Tap Measurements

The near furnace wall gas composition was measured via approximately forty through-waterwall furnace gas taps. The location and method of testing with these taps was shown in section B of this report. The prime variable analyzed for these tests was the local oxygen level. CO data was also taken at these locations, however, it was primarily used to confirm the oxygen reading. That is, there was a fairly consistent localized semi-logarithmic inverse relationship between oxygen and CO.

The local oxygen level was the primary variable because it could directly verify the wall air "blanketing" effect of the concentric firing system. It could also show areas where a low oxygen environment may exist. These low oxygen areas were also thought to exhibit a higher potential for boiler tube corrosion. The UT tests did not show any areas of high boiler corrosion rates (all elevation averages less than 2 MPY and the whole boiler average was 0.75 MPY). Therefore, for this furnace, firing system, and coal sulfur level, corrosion appears to be independent of the local oxygen level.

For this program four complete and one partial gas tap tests were performed. A summary of the results is presented in Table 9.

A discussion of each of the tests and the implications of the gas tap oxygen level results is shown next.

In full load Test No. 1, there was a significant number of low oxygen (<5%) gas tap readings. The facts that the windbox-furnace ΔP was substantial (5.5 to 6.1 inches w.g.), that the excess oxygen level was moderate (flue gas oxygen level of 4.2%), that the overfire air compartments were 100% open, and

TABLE 9

HUNTER UNIT NO. 2
GAS TAP RESULTS SUMMARY

Gas Tap Test No.	Corresponding Characterization Test Nos.	Load MW_e	(%) OFA	Offset Angle	Flame Holders	% Excess O_2	Aux. Bank (% Open)	Furnace/ Windbox ΔP (in. w.g.)	Total Data Pts.	No. of Data Pts. in or Above the Burner Zone at Specified O_2 Conditions O_2 <1%	O_2 <2%	O_2 <5%	Comments
1	266-269	400	100	17°	-	4.2	12-30	5.5-6.1	32	0	2	12	1
2	504-508	320	100	8°	✓	3.1	0	3.0-3.4	32	9	16	26	2
3	518-521	430	100	8°	✓	3.5	12	5.0-5.2	34	4	9	21	-
4	531-533	190	0	8°	✓	6.0	10	2.5-3.0	34	0	0	1	-
5	182,184,185	420	0	17°,25°,33°	-	6.0	70-100	5.5-6.0	18	0	0	0	3

Comments:

(1) The auxiliary air compartments (aux. bank) were 30% open, except for about an hour at the beginning of the test when the board operator allowed the load to drop to 385 MW_e, and subsequently the aux. bank level automatically decreased to 12% open.

(2) The upper right side of the furnace experienced very low (<2%) O_2 levels.

(3) The 18 data points represent results from Gas Tap locations 17, 18, 19, 23, 24 and 25 (located just above and below the top elevation of burners). These data were taken during three tests run at offset angles of 17°, 25° and 33°.

that the auxiliary air compartments were not open very wide (only 12 to 30%) indicates that much of the combustion air was being diverted to the overfire air compartments, thereby creating a high fuel/air ratio in the burner zone. This suggests that combustion zone stoichiometry may have an effect on wall oxygen levels.

Full load Test No. 3 was run at similar conditions to Test No. 1, except that the effect of the LNCFS was reduced by setting the offset angle to a minimum value of 8°. The fact that Test No. 3 experienced a substantially greater number of low oxygen readings than Test No. 1 may be due to the lower level of excess air fired, but may also be due to the LNCFS having operated somewhat effectively during Test No. 1.

In Test No. 2, the fact that most of the gas taps yielded low 02 levels was simply due to the closed auxiliary air dampers, caused by the lower load and excess oxygen levels.

Test No. 4 was run at typical half-load conditions, i.e., no overfire air, high excess air levels (6.0% excess oxygen), low windbox-to-furnace ΔP (2.5 to 3.0 inches w.g.), and low auxiliary air compartment levels (10% open). These conditions created a very low fuel/air ratio. As such, only one of the 34 gas tap readings yielded an 02 level of less than 5%. Since the effect of the LNCFS was reduced by setting the offset angle to a minimum level (8°), this supports the theory that the all oxygen levels are governed by the combustion zone stoichiometry.

Limited gas tap Test No. 5 was run at full load, but also at conditions which typically create a low combustion zone fuel/air ratio (i.e., no overfire air, high excess air [6% flue gas oxygen], and a high windbox/furnace ΔP [5.5 to 6.0 inches w.g.]). Results show that of the 18 measurements taken, none experienced an oxygen level of less than 5%. While these 18 points represent a total of only 6 different gas tap locations (from 3 separate characterization tests), these results are significant because in each of the other full load gas tap tests (No. 1, 2 and 3), at least 1 of these 6 gas tap locations experienced an oxygen level of less than 5%. As in the other four gas tap tests, combustion zone stoichiometry appears to have a significant, if not controlling effect on wall oxygen levels. However, in Test No. 5, the conditions were conducive to greater auxiliary velocities and flow rates such that the LNCFS may also have had an effect on the wall oxygen levels.

Since both the overfire air compartments and the auxiliary air compartments receive their air supply from the same source (i.e., the corner windbox), the use of overfire air diverts air away from the combustion zone. This in turn reduces the air flow rate and velocity through the auxiliary air compartments. Because the use of overfire air increases the fuel/air ratio in the burner zone, the above results suggest that the lower wall oxygen levels which were experienced at higher combustion zone fuel/air ratios may have been due to insufficient auxiliary air flow rates and/or velocities through the LNCFS. The final modification installed in February 1984 increased the auxiliary/LNCFS air velocity but no gas tap test was conducted during the final characterization series to ascertain its effects on wall oxygen level.

Regarding the effect of flame holders (flame diffusers), the majority of the combustion air passes through either the auxiliary air or overfire air compartments. Only a small fraction of the combustion air passes through the burner nozzles, to which the flame holders are attached. Because of this, it is felt that the flame holders should have a minimal effect on wall oxygen levels.

III. CORROSION TEST CONCLUSIONS

Low-NO_x boiler operation with the concentric firing (LNCFS) system and overfire air does not detrimentally effect furnace waterwall material wastage rates. This was shown with over 1,000 ultrasonic wall thickness measurements. There did appear to be a slightly higher wastage rate at higher furnace elevations compared to the lower furnace/hopper region. However, in all cases the loss rate was less than 2 MPY and for the whole boiler average the loss rate was 0.75 MPY. Also, near burner wastage rates on the downstream side of the fuel jets, though higher than the whole boiler average, were less than 2 MPY.

The use of corrosion probes yielded only qualitative trends even after 1000 hours of testing. The wastage rate results from the probe tests were conservative (higher) when compared to the actual UT results. The probe method did show that Hastelloy C-276 coating or chrome plating did not reduce wastage. The probes also appeared to show that Type T-22 2-1/4% chromium-molybdenum steel has a marginally lower long term wastage rate than Type SA-210 carbon steel.

Limited gas tap testing at the Hunter No. 2 unit has shown that wall oxygen levels are related to combustion zone stoichiometry. This stoichiometry is greatly affected by total excess air levels and the use of overfire air, and is an indirect indication of auxiliary air flow rates and velocities. An evaluation of the effectiveness of the LNCFS for blanketing the walls with air to overcome low wall oxygen levels (usually associated with high combustion zone stoichiometries) suggests that, under certain conditions, the LNCFS may have been working effectively for this unit. However, more definitive conclusions cannot be reached with the available data.

PART G

SOLIDS TESTING

As discussed in Part A, the Program Approach Section, unburned hydrocarbons and particulate testing were conducted during this program as part of the evaluation of the overall system effect of low-NO_x firing operations. In addition to carbon monoxide (CO) gaseous emissions data, flyash samples were taken and analyzed for their carbon content. The particulate testing consisted of mass loadings, particle size distributions and electrostatic precipitator performance.

Three complete particulate tests were performed over a two-day period by Entropy Environmentalists, Inc under a subcontract to Exxon Research and Engineering, Co. These tests included mass loadings in both ESP inlet ducts, particle size distributions in either duct and determining flue gas properties at the ESP inlet. The ESP performance was determined by taking mass loadings (in both ducts) at the outlet of the ESP. Flyash samples were taken during 32 of the characterization tests. Of these 32 samples, 21 came from full load tests, 9 from 3/4 load tests and two from a 1/2 load test.

Carbon-In-Flyash Results

Because carbon-in-flyash is directly related to boiler performance the complete examination of this type of solids was presented in Part D of this report. However, a summary of the results has been presented again here for completeness. Please refer to Figures 43 and 44 and Table 5 for the principal carbon-in-flyash results.

For this program there appeared to be no direct relationship between the carbon monoxide (CO) value for a test and the carbon-in-flyash level. This is shown in Figure 44. That is, several tests reported high CO levels with low carbon-in-flyash results and several had high carbon-in-flyash results with low CO levels. A similar analysis between excess oxygen level and carbon-in-flyash also presented no trends or relationships. The excess oxygen level range examined (2.5% to 6.5% O_2) was representative of the normal boiler operating range (for load following conditions).

There did appear to be a trend of increasing carbon-in-flyash levels (Figure 43) as the NO_x emissions were reduced. This may be due to the staged combustion method of NO_x reduction. That is, staged combustion inhibits gas mixing and fuel firing zone airflow. Previous work (refer to EPA Report No. 600/7-77-117, October 1977) in this area has shown that reducing the airflow to the fuel firing zone to below stoichiometric levels can have a negative impact on carbon heat loss. Thus, the trend presented in Figure 43 is probably only a second order relationship. As techniques are developed which reduce NO_x without lowering the firing zone stoichiometry this trend may change.

Comparison of Baseline to Post-Modification Flyash results is only qualitative because the baseline tests were conducted without overfire air and only three points are available. However, Figures 43 does appear to show that the low-NO_x modifications successfully reduce NO_x without increasing carbon refuse losses.

Grain Loading Runs

The total grain loading results (summarized in Table 10) show that for the conditions of the tests (350-375 MWe), particulate emissions were 0.03 pounds per million Btu's of heat input, and the ESP had a collection efficiency of greater than 99%.

Particle Size Distribution Runs

The results of the size distribution runs are summarized in Figure 46 which contains three plots (one for each of the three test runs). For any given particle size (vertical axis), the plots show the amount (in percent -- horizontal axis) of the total mass (of all particles) which is made up of

TABLE 10

PARTICULATE LOADING IN FLUE GAS -- SUMMARY

Run Date	ESP Inlet		ESP Outlet			ESP Collection Efficiency (%)
	Grains* / DSCF**	Pounds / Hour	Grains* / DSCF**	Pounds / Hour	Pounds / MBtu	
10-13-84 (morning)	3.281	29,400	0.0130	99.2	0.025	99.6
10-13-84 (Afternoon)	3.526	31,300	0.0081	60.9	0.014	99.8
10-14-84	3.714	30,200	0.0289	208.0	0.052	99.2
Average	3.507		0.0167		0.030	99.5

*7,000 Grains = 1 Pound
**DSCF = Dry Standard Cubic Foot (1 atm, 68°F)

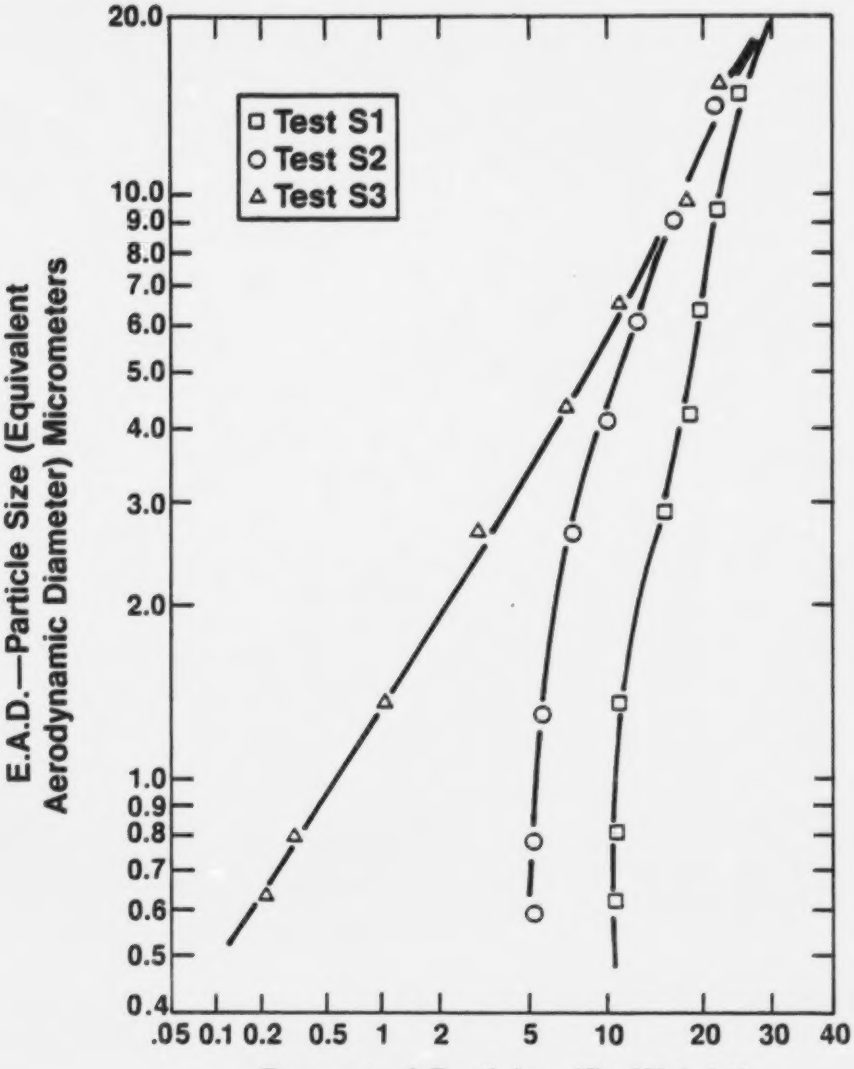


Figure 46. Particle size distribution in ESP inlet duct-log equivalent aerodynamic diameter versus probability of size occurrence.

particles smaller (in equivalent aerodynamic diameter - EAD) than the stated size. For example, the plot of Test S1 results show that about 15% of the particulate mass is made up of particles having an EAD of less than 4 μm. Test conditions are summarized in Table 11.

Figure 46 indicates a nearly log-normal particle size distribution (PSD) for each test. This is typical for coal-fired boilers. Also, in each case, about 75% (by weight) or greater, of the particles were larger than EAD values of about 15 p. In comparing the difference in the curves for the three tests, the coarser PSD for Test S3 (compared to Tests S1 and S2) could be due to day-to-day coal changes at the plants. Specifically, the ash content of the coal sometimes varied by up to 5% from day-to-day (typically varied between 11%-18% ash). This would cause changes in the pulverizer performance.

When considering the size distribution data, one should consider how the PSD results may have been influenced by the heavy grain loading at the sampling locations. For example, because of the heavy grain loading, the sampling time had to be kept short (10 minutes) in order not to overload the impactor stages. The short sampling times, meant that the set-up time (needed to establish isokinetic conditions may have been a significant portion of the total sampling time. Also even with the short sampling times some of the stages overloaded anyway (> 10 mg per stage) and could have produced somewhat biased results.*

CONCLUSIONS

The analyses of particulate matter (PM) show no adverse effects on PM emissions while using low-NO_x firing techniques. Figure 46 shows that more than three quarters (by mass) of the PM entering the ESP has a size (EAD) greater than 15 microns. These large particles are easily removed from the gas stream and overall, the ESP operated with a collection and removal efficiency of more than 99%. Consequently, the ESP outlet (scrubber inlet) loading was 0.03 pounds per MBtu.

*Overloading leads to re-entrainment which would bias the results to show smaller particles than is truly the case.

TABLE 11

HUNTER UNIT NO. 2
ESP INLET PARTICLE SIZE DISTRIBUTION (PSD)
TEST CONDITIONS

PSD TEST NO.	DUCT	CHARACTERIZATION TEST NO.	LOAD MW_e	% EXCESS OXYGEN
S1	Right	393	371	3.64
S2	Left	393	371	3.64
S3	Left	398	350	3.24

Operation of the boiler under low-NO_x conditions does not appear to affect boiler operation. Boiler efficiency levels of about 90% were maintained, full-load carbon-in-flyash ash levels were under the utility's 5.0% requirement for flyash disposal, and the ESP was able to achieve high particulate removal efficiencies.

PART H

QUALITY ASSURANCE

The manufacture and installation of all boiler components followed all applicable American Society and Testing and Materials (ASTM) standards. The modifications consisted primarily of windbox and combustion air components although the use of the waterwall corrosion probe ports required the installation of bent waterwall tube inserts. Heat treating of welded type 446 stainless steel components was required and checked during manufacture. Waterwall tube inserts were hydrotested upon installation. During each of the installation and subsequent maintenance outages all windbox tolerances and linkage movements were checked and adjusted as required.

As an additional check for this program, a prototype concentric firing system nozzle tip was installed in Utah Power and Light's Hunter Unit No. 1, a sister unit to the project unit, Hunter No. 2. This prototype was utilized to examine the design integrity of the material and horizontal offset linkages.

Exxon Research and Engineering Company gathered all of the data for this program under EPA Contract No. 68-02-2696. Therefore, this section has been excerpted from ER&E's final project report.

In order to insure that the data gathered under this program was of acceptable quality, certain quality control and quality assurance (QA/QC) procedures were implemented. For the gaseous data, the QA/QC measures included certification of calibration standards as well as frequent recalibration of emission monitors. For the particulate sampling system, QA/QC steps included careful measurement and calibration of sampling nozzles and sample metering systems. Finally, for the corrosion measurements, the QA/QC procedures included repeatability tests.

I. GASEOUS EMISSIONS TESTING

In the gaseous emissions tests both flue gas and furnace gas composition were monitored by extractive CEMs. Data quality was dependent on four key parameters:

- Accuracy of the calibration standards ("cal gases").
- Quantity of data gathered.
- Stability (drift speed) and frequency of recalibration of the CEMs.
- Absence of leaks in the sampling system.

For each instrument, several calibration gases were used to zero and span its measurement range. When setting up each gas analyzer, calibration gas (a gas of known concentration--for example 4.5% O2) was fed to it, and the instrument's output was adjusted using the real-time data acquisition/computer system CRT until it read the same as the calibration gas standard. The concentration of each calibration gas was measured in the laboratory (usually by gas chromatography) using standards that were traceable to the National Bureau of Standards (NBS). After mixing, but prior to analysis of each calibration gas, the gas was allowed to stand for several days to insure that equilibrium was reached and that its composition was stable. Each calibration gas mixture was used before the expiration date of its analytical certification.

The accuracy of test results was greatly enhanced by the data acquisition/computer system. Utilizing a Macosym II^{TM} computer (made by Analog Devices), the data acquisition system was programmed to take a full set of gaseous emissions data every 2 seconds. Therefore, by sampling each probe assembly (3 sample points) for one minute, the resulting gaseous data for each component (NO_x , CO, etc.) was a composite of 360 separate pieces of data (1 minute per probe assembly, 4 probe assemblies, three sample points per probe assembly).

The analyses and the stability of the calibration gases were further checked in the field by comparing old gases with new ones each time a gas cylinder was replaced. In this procedure, a CEM would be calibrated with an old calibration gas just before the gas cylinder was replaced. Then the new calibration gas would be measured using the CEM that was calibrated on the old gas. If the reading of the new gas was within ± 5% of the concentration certified by the laboratory, then both the old and new gases were tentatively accepted at that time. These procedures insured the accuracy of the calibration gases.

Another requirement for quality CEM data was the stability (drift) of the monitor between calibrations. Span drifts of less than ± 5% (of the calibration gas concentration) between calibrations were considered acceptable. Compliance with this goal was accomplished by frequent calibrations so that regardless of any particular instrument's drift rate, it was recalibrated often enough to insure that reading would always be within ± 5% of the true reading.

The final requirement for quality CEM data was the absence of leaks in the sampling system. A leak on the vacuum side of the sampling pump would pull air in with the sample and dilute it. Such dilution could occur only on the vacuum side of the pumps and was thus minimized by placing the pumps as close as possible to the sampling location. If a leak did occur on the vacuum side of the pump, it revealed itself in the form of a high oxygen reading on the O½ monitor or as a slight flow rate or pressure reading in the analytical van when the system was dead-ended. Leaks were then quickly discovered and corrected.

For example, when sampling a flue gas containing 2% oxygen, a leak equal to just 10% of the sampling rate would cause the oxygen monitor to show about 4%. Because four separate sampling systems were used to bring flue gases to the analyzers, any one system containing a potential leak could be discovered quickly by comparing the four O_2 readings with each other.

Finally, even the smallest leaks were factored out by computer-correcting all measured gas concentrations (other than 0_2) to a standard dilution (3% 0_2).

II. SOLID SPECIES TESTING

A. Fly Ash Sampling

Fly ash samples were taken by either Exxon or C-E personnel at the end of each specified characterization tests in order to analyze for unburned carbon. To insure that the fly ash was from only the test under consideration and not from a prior tests, the following procedure was followed. Test conditions were set and the test was started. Then after about 20 minutes, the fly ash sample container was emptied and replaced. Finally, as the test was continued, the sample container was filled and then removed (with its sample) about twenty minutes later. This required longer characterization tests run times than was normally practiced.

Fly ash samples were then sent to C-E for chemical analysis. A large sample (41 liter) was taken each time in order to reduce any analytical biases.

B. Particulate Loading and Size Distribution

The accuracy of the particulate loading and size distribution measurements is heavily dependent upon the accuracy of the sampling rate and stack gas velocity measurement equipment. The following equipment or calibrated standards were used in the measurements.

- Dry gas meter - used to measure sampling rate.

  Each dry gas meter was calibrated against a spirometer (at several different flow rates) and was found to be accurate within 1%.

- o Orifice meter - used to measure sampling rate (required to isokinetic sampling).

  Each orifice plate coefficient was calibrated at several different flow rates to allow the instantaneous determination of sampling rates during each field test.

- o Nozzle Diameter - used to determine sampling velocity.

  The diameter of the sampling nozzle is used with the sampling rate data to determine the velocity of the sample as it enters the nozzle. This allows the sampling rate to be adjusted as necessary during sampling to insure that the nozzle gas velocity equals the duct gas velocity so that the sampling system does not disturb the system being sampled. This insures that a representative sample will be obtained. All nozzle diameters were measured at least eight times (along several different axes) and no reading on any nozzle was more than two percent away from the average.

III. CORROSION MONITORING

In the corrosion study, tube wall thicknesses were measured to the nearest ten-thousandth of an inch (or four significant digits) in order to detect small thickness changes (1 or 2 mils) in a relatively large base value (about 250 mils).

In the following discussion, the reader should keep in mind the fact that all measured thicknesses were about 250 mils. Previous ER&E experience has shown that when measuring a single point on a tube with a rough surface, the precision of any one reading may be off from the true value by as much as one mil or more. The problem is compounded when one adds in the uncertainty of finding the same point on two successive readings; especially when those readings are two years apart. Of course this is not acceptable when thickness changes of just one or two mils are being examined. Fortunately, by averaging large amounts of data, the individual random errors can be averaged out and the accuracy is very much improved. The more data that is averaged, the higher the accuracy of the result. This explains some of the anomalies in the thickness tables presented in Part F of this report. The reader will note that as more data points make up tabulated values, the trend lines become smoother.

Duplicate measurements of groups of about 15 data points each show that it is not unusual for repeat measurements of individual tubes to differ from the original measurements by a mil or more. But the average value obtained for the group is repeatable within about 0.2 or 0.3 mils. Hence, when performing data analysis, thickness changes at a single measurement point should not be heavily weighted. Instead, the average change for a group of points (in the same region of the furnace) is far more significant. In fact, when considering one data point at a time, it is not unusual to see negative thickness changes. Of course, such values, for the reasons cited above, are insignificant and will diminish when averaged into large groups of data. These claims are supported in Table 12 which presents the results of duplicate readings from about 50 measurement locations. Each duplicate reading was made by the same operator using the same instruments as in the original reading, and each duplicate reading was made within a day or two of the original reading. (Of course the original measurement results were not made available to the instrument operator as the duplicate measurements were being made.)

The table shows that under these conditions, repeat measurements of a single point in the boiler may differ from each other by more than 2 mils and differences of about one mil are not unusual. However when as few as fifteen measurements are averaged, the repeatability (on the average) is much improved. In fact, when all 47 points on the table are considered, the average repeatability is within about 0.13 mils (0.0013 inches) or about 1/2% of the average value. The data shown on Table 12 is typical. However, because the corrosion losses being considered in this report are so very small relative to the base values, a single tube with a large loss could easily influence the average of even a large number of data points. An example of this was pointed out in Part F of this report.

TABLE 12

COMPARISON OF DUPLICATE THICKNESS MEASUREMENTS

(made in February, 1984 by the same operator using the same instrument)

Identification of Measured Location				First Reading	Second Reading	Difference = First-Second
Wall	Elevation	Tube No.	Top, Middle, or Bottom Position	(mils)	(mils)	(mils)
Left	Level B	121	T	244.9	244.8	+2.1
		121	M	250.0	249.3	+0.7
		121	B	246.9	245.7	+1.2
		133	M	254.0	253.5	+0.5
		139	M	235.4	234.4	+1.0
		145	T	245.4	246.6	-1.2
		145	B	251.9	252.1	-0.2
		151	M	246.2	248.0	-1.8
		163	M	236.2	236.4	-0.2
		175	T	251.9	251.5	+0.4
		175	M	251.0	250.0	+1.0
		175	B	244.9	244.9	0.0
		187	T	237.7	236.7	+1.0
			B	235.7	236.9	-1.2
						+0.236
	Level C	119	T	246.2	246.5	-0.3
		119	B	249.5	249.4	+0.1
		125	T	256.3	255.9	+0.4
		125	M	253.0	251.7	+1.3
		125	B	253.5	252.7	+0.8
		131	M	239.9	240.0	-0.1
		137	T	256.0	256.0	0.0
		137	B	245.7	245.5	+0.2
		149	T	238.5	239.5	0.0
		149	M	243.1	244.9	-1.8
		149	B	251.6	251.5	+0.1
		161	M	241.9	242.4	-0.5
		173	T	251.4	251.4	0.0
			B	250.8	250.5	+0.3
		179	M	240.8	242.0	-1.2
		185	M	240.9	241.5	-0.6
						-0.081

TABLE 12 (Cont'd.)

COMPARISON OF DUPLICATE THICKNESS MEASUREMENTS

(made in February, 1984 by the same operator using the same instrument)

Identification of Measured Location				First Reading	Second Reading	Difference = First-Second
Wall	Elevation	Tube No.	Top, Middle, or Bottom Position	(mils)	(mils)	(mils)
Right	Level C	104	T	250.7	249.9	+0.8
		104	B	250.4	250.3	+0.1
		110	M	238.4	239.5	-1.1
		122	T	247.6	247.5	+0.1
		122	M	250.2	251.2	-1.0
		122	B	243.1	242.2	+0.9
		134	T	250.1	249.7	+0.4
		134	B	239.5	240.1	-0.6
		140	M	253.9	251.8	+2.1
		146	M	244.9	244.3	+0.6
		152	T	247.6	247.3	+0.3
		152	M	241.7	242.1	-0.4
		152	B	247.3	247.1	+0.2
		164	M	246.0	245.8	+0.2
		170	T	241.6	241.8	-0.2
		170	B	250.6	250.1	+0.5
		182	M	247.1	245.9	+1.2
						+0.241
			UNWEIGHTED AVERAGE			+0.132

Another important consideration is that the corrosion rate may be influenced by the process used to measure it. In the ultrasonic method of measuring tube wall thickness, the slag and other surface deposits (mill scales etc.) must be cleaned from the outside surface of the tubes before they can be measured. However, these surface layers (oxides, slag, etc.) may act as protective coatings that inhibit further oxidation, sulfidation, or other precursors to corrosion. The result is that a freshly cleaned tube (such as one that was prepared for thickness measurements) may corrode faster than a pre-conditioned tube that is left alone.

In order to quantify this effect, on certain tubes, two points (one a few inches above, and the other just below the point of interest) were measured during the February, 1984 visit. Generally, if the point of interest (the one on the chalk line discussed earlier) had not been interfered with (for example by cleaning it for measurement in September, 1981), then its thickness (in February 1984) should equal the average of the points just above and below it. But, for reasons already discussed (occasionally large random errors), this conclusion would hold true on the average, only when large groups of data are considered. If, on the average, the conclusion does not hold, then the difference must be due to accelerated corrosion on the points that were cleaned for measurement in September 1981. A table of such data could be used quantify the effect. Table 13 was assembled for that purpose.

The table considers only a portion of the data that were reported in Part F of this report. Specifically the data used to compile Table 13 include only those locations for which all three points (top, middle, and bottom) were measured in February, 1984. The "T" and "B" positions were measured for the first time in February, 1984, while the "M" positions had already been cleaned and measured once before (in September, 1981) and might have a built-in bias (accelerated corrosion rate) as a result of the cleaning procedure used for the previous measurements. Table 13 shows that on the average, the previously measured point ("M") is about one mil thinner on its second reading than the average of the two surrounding points (T and B).

TABLE 13

EVALUATION OF MEASUREMENT BIAS

COMPARISON OF DIRECTLY VS INDIRECTLY MEASURED DATA

Data Source		Direct Measurements (Middle Points Only)	Indirect Measurements (Average of Top and Bottom Points)	Difference (Indirect-Direct)
Front and Rear Walls				
Elevation	Tube Nos.	mils	mils	mils
A	1-247	241.95	242.78	0.83
B	1-247	243.17	243.13	-0.03
C	1-83	245.20	245.55	0.35
C	82-165	241.42	243.99	2.57
C	164-247	238.94	239.19	0.25
D	1-83	242.14	244.20	2.06
D	82-165	241.42	241.84	0.42
D	164-247	242.96	243.22	0.26
E	1-247	241.95	243.78	1.83
F	1-247	239.94	240.95	1.01
UNWEIGHTED AVERAGE				0.955

* In September of 1981 the tubes reported on this table were measured at the location of interest (along the chalk lines) only. Then, in February of 1984, these same locations were remeasured, but, for each tube location reported on this table, two additional points were also measured -- one just above, and one just below the chalk line (by a few inches). The average thickness of the top and bottom points should equal to the thickness value at the middle point. If it does not, then on the average, the difference may be due to the measurements' built-in bias as explained in the report.

The results presented in Part F of this report have not been adjusted to reflect this bias for two reasons. First, by not factoring out the bias, a measure of conservatism is added to the results. The second reason is that during the September 1981 measurements, many of the tubes were cleaned excessively prior to measurement. Thus the difference reported on Table 13 may be partially due to metal removed in the September, 1981 measurements rather than accelerated corrosion after the measurement. This effect, however, was minimized by remeasuring those same points (to the extent possible) in February of 1984 while taking extra care not to remove any metal from the tubes' surfaces as they were cleaned (by motorized wire brushing wheel) in preparation for the measurements.

IV. GAS TAP MEASUREMENTS

The goal of the gas tap measurements was to detect large differences in oxygen and CO levels along the furnace walls and to relate these to the effectiveness of the LNCFS, at different operating conditions. Because very precise readings were not required, rigorous calibration procedures (as in the case of the characterization testing) were not followed.

The two gas tap instruments were initially calibrated in the analytical van. The MSA Model 1000 measures (0 - 25% oxygen and 0 - 2000 vppm CO). Its oxygen scale was calibrated with nitrogen for the zero, and ambient air for the span (21% O_2) gas. The CO scale was adjusted using nitrogen for setting the zero point, and using several CO calibration gases (779 vppm and 1400 vppm) for span adjustment. The Sun Instrument (0 - 10% CO) was calibrated using internal electronic calibrations, plus a 1.5% CO span gas.

Once the MSA instrument was initially calibrated it was normally re-calibrated once during the test and once after the test, unless a filter cartridge had to be replaced. If the oxygen scale was found to be accurate within ±0.5%, then all oxygen data was considered acceptable. If the CO instrument readings were within 100 vppm, then they were also accepted. Regarding the Sun Instrument, electronic re-calibrations were performed a every reading. In addition, calibration using calibration gas was performed after each test. If the calibration yielded results that were accurate within ±10% of the true value, then the results were considered acceptable.

During testing, certain precautions were taken to protect the MSA instrument's CO detection cell from being exposed to very high CO concentrations (?J 2000 vppm). First, the Sun Instrument was used to detect preliminary CO levels. If the levels were ?J 1,500 vppm, then the Sun instrument's CO reading was used. For lower CO readings the MSA instrument was used. The MSA instrument was always used to measure 02 levels, however its CO sensor was often bypassed when CO levels were known to exceed its range.

Additionally, because samples were being extracted from a very harsh environment (i.e., one including high levels of combustible and corrosive species), close attention was given to the particulate and condensate filters to insure that they were not over loaded. Both instruments were equipped with such filters and the filter media was replaced as needed.

PART I

REFERENCES

1. Zeldovich, Ya. B., Sadovnikov, P. Ya., and Frank-Kamenetskii, D. A., Oxidation of Nitrogen in Combustion, Academy of Sciences of the USSR, Institute of Chemical Physics, Moscow - Leningrad, Translated by M. Shelf, 1947, Scientific Research Staff, Ford Motor Co.

2. Bueters, K. A., Habelt, W. W., Blakeslee, C. E., and Burbach, H. E., NO_x Emissions from Tangentially Fired Utility Boilers - A Two Part Paper, Paper presented at the 66th Annual AIChE Meeting, Philadelphia, PA., Nov. 11-15, 1973, Combustion Engineering Publication TIS-3698.

3. Habelt, W. W., and Selker, A. P., Operating Procedures and Prediction for NO_x Control in Steam Power Plants, Paper presented at the 1974 Spring "Technical Meeting of the Central States Section of the Combustion Institute, Madison, WI., March 26 and 27, 1974, Combustion Engineering Publication TIS-40001.

4. Habelt, W. W., and Howell, B. M., Control of NO_x Formation in Tangentially Coal-Fired Steam Generators, Paper presented at EPRI NO_x Control Technology Seminar, San Francisco, CA., February 5-6, 1976, Combustion Engineering Publication TIS-4769.

5. Marshall, J. J., and Selker, A. P., The Role of Tangential Firing and Fuel Properties in Attaining Low NO_x Operation for Coal Fired Steam Generation, Paper presented at EPRI NO_x Control Technology Seminar, Denver, CO., November 8-9, 1978, Combustion Engineering Publication TIS-5623A.

6. Heap, M. P., Lowes, T. M., Walmsley, R., and Bartelds, H., Burner Design Principles for Minimum NO_x Emissions, Proceedings, Coal Combustion Seminar, Research Triangle Park, NC., September 1973, EPA 650/2-73-021 (NTIS PB224210).

7. Pershing, D. W., and Wendt, J. O. L., Pollutant Control Through Staged Combustion of Pulverized Coal, University of Arizona, Presented at the Sixteenth International Symposium on Combustion, Boston, MA., August 1976.

8. Levy, J. M., Pohl, J. H., Sarofim, A. F., and Song, Y. H., Combustion Research on the Fate of Fuel-Nitrogen under Conditions of Pulverized Coal Combustion, Interagency Energy/Environment R&D Program Report, Prepared for EPA, August 1978, EPA-600/7-78-165 (NTIS PB286208).

9. Sternling, C. V., and Wendt, J. O. L., Kinetic Mechanisms Governing the Fate of Chemically Bound Sulfur and Nitrogen in Combustion EPA-650/2-74-017 (NTIS No. PB 230895), Aug. 1972.

10. Anson, D., Moles, F. D., and Street, P. J., Structure and Surface Area of Pulverized Coal During Combustion, Combustion and Flame, Volume 16, No. 265, 1971.

11. Mandel, B., Gasification of Coal Char in Oxygen and Carbon Dioxide at High Temperature, S. M. Thesis, M.I.T., 1977.

12. Wendt, J. O. L, and Schulze, O. E., On the Fate of Fuel Nitrogen During Coal Char Combustion: AIChE Journal, Vol. 22, No. 102, 1976.

13. Heap, M. P., Lowes, T. M., Walmsley, R., Bartelds, H., and LeVageurese, P., Burner Criteria for NO_x Control: Volume I. Influence of Burner Variables on NO_x in Pulverized Coal Flames, International Flame Research Foundation Ijmuiden, Holland, Report EPA-600/2-76-061a (NTIS PB259911), March 1976.

APPENDICES

A. Characterization Tests Operating and Emissions Data Summary

B. Characterization Tests Board and Computer Data

APPENDIX A FOOTNOTES

1. Fuel elevation 5 limited to 65 percent of capacity.

2. NO_x emissions data may be bad due to instrument error, results not repeatable.

3. NO_x emissions meter not calibrated.

4. Left front overfire air compartments at +10 degree tilt.

5. Top fuel air dampers open 100 percent.

6. Due to ignition point encroachment, the elevation 1 left rear burner's fuel air damper was open to 100 percent.

7. Rotameter leak caused bad CO readings.

8. Top auxiliary air compartment dampers (AUX 0-1) were 100 percent open and at an 8 degree offset angle.

9. Summary and emissions data only available for these tests.

10. Left front burners on elevations 4 and 5 and the right rear burner on elevation 5 were at horizontal burner tilt due to broken linkages.

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			2	3	4	5	6	7	8	9	10	11
Date	1981		8/3	8/3	8/3	8/4	8/4	8/4	8/4	8/5	8/5	8/5
Time			13:02	14:52	15:56	12:49	13:28	14:13	14:56	10:23	11:21	13:13
Purpose of Test			As Found	Low O_2	High O_2	As Found	OFA 25%	Aux 5-5 Closed 50% OFA	OFA 100%	As Found	OFA 75%	OFA 100%
Unit Load	Gross MW		402	405	406	423	395	406	403	403	399	399
Excess Air	L.N.H.		N	L	H	N	N	N	N	N	N	N
Fuel Elevations in Service			All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr		2872	2831	2843	2792	2835	2854	2850	2808	2804	2799
SHO Temperature	Deg. F		991	1001	1008	993	1001	996	988	1006	999	1004
RHO Temperature	Deg. F		992	1014	999	1004	1000	993	994	1017	1004	1008
OFA Nozzle Tilt	Deg. from Hor		0	0	0	0	0	0	0	0	0	0
Burner Nozzle Tilt	Deg. from Hor		+2	-5	-20	0	0	0	0	+10	+6	+7
Offset Angle	Deg. from Fuel		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Windbox Compartment Damper Position - % Open		OFA 2	20	0	0	0	25	50	100	11	75	100
		OFA 1	20	0	0	0	25	50	100	11	75	100
		AUX 0-1	20	0	37	25	0	13	0	20	0	0
	A	COAL 1	100	100	100	100	100	100	100	100	100	100
		AUX 1-2	20	0	37	25	0	13	0	20	0	0
	B	COAL 2	100	100	100	100	100	100	100	100	100	100
		AUX 2-3	20	0	37	24	0	13	0	20	0	0
	C	COAL 3	100	100	100	100	100	100	100	100	100	100
		AUX 3-4	20	0	37	25	0	13	0	20	0	0
	D	COAL 4	100	100	100	100	100	100	100	100	100	100
		OIL 4-5	20	0	37	25	0	0	0	20	0	0
	E	COAL 5	80	78	78	93	93	93	93	92	92	92
		AUX 5-5	60	60	60	60	60	0	0	60	0	0
Flue Gas Oxygen Level	% O_2		4.39	2.34	5.77	4.41	4.26	4.09	4.10	5.21	4.73	4.55
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		431	191	508	588	567	519	385	503	394	375
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		12	27	22	35	43	47	33	44	42	47
NOTES:			(1)	(1),(2)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			12	13	14	15	16	17	18	19	20	21
Date	1981		8/5	8/5	8/6	8/6	8/6	8/6	8/6	8/6	8/6	8/6
Time			14:33	15:31	9:42	10:34	11:11	12:23	13:44	14:240	15:21	16:12
Purpose of Test			OFA Tilts Down	OFA Tilts Up	As Found	Fuel Air Dampers	Fuel Air Dampers	Fuel Air Dampers	OFA 60%	OFA 60%	Normal Fuel Air	Low Air
Unit Load	Gross MW		402	401	395	396	394	394	391	394	393	393
Excess Air	L.N.H.		N	N	N	N	N	L.N	L.N	N	N	L.N
Fuel Elevations in Service			All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr		2798	2791	2765	2761	2757	2749	2756	2743	2754	2750
SHO Temperature	Deg. F		1007	1012	1003	1004	1005	1010	999	1014	1004	1005
RHO Temperature	Deg. F		1020	1024	1011	1010	1011	1009	1000	1018	1009	1009
OFA Nozzle Tilt	Deg. from Hor		-10	+30	0	0	0	0	0	0	0	0
Burner Nozzle Tilt	Deg. from Hor		+6	+6	+2	-5	-10	+5	+15	+3	-3	-8
Offset Angle	Deg. from Fuel		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Windbox Compartment Damper Position - % Open		OFA 2	100	100	0	0	0	0	60	60	60	60
		OFA 1	100	100	0	0	0	0	60	60	60	60
		AUX 0-1	0	0	21	21	26	16	0	18	0	0
	A	COAL 1	100	100	100	70	50	50	50	50	100	100
		AUX 1-2	0	0	21	21	16	16	0	18	0	0
	B	COAL 2	100	100	100	70	50	50	50	50	100	100
		AUX 2-3	0	0	21	21	21	16	0	18	0	0
	C	COAL 3	100	100	100	70	70	50	50	50	100	100
		AUX 3-4	0	0	21	21	21	16	0	18	0	0
	D	COAL 4	100	100	100	70	70	50	50	50	100	100
		OIL 4-5	0	0	21	21	21	16	0	18	0	0
	E	COAL 5	93	92	92	70	70	50	50	50	92	92
		AUX 5-5	0	0	60	60	60	60	0	0	0	0
Flue Gas Oxygen Level	% O_2		4.14	3.80	4.70	4.45	4.55	BD	3.15	3.99	4.16	3.21
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		374	327	488	459	387	BD	345	317	367	311
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		48	43	62	63	56	BD	43	49	37	46
NOTES:			(1)	(1)	(1)	(1)	(1)	(1),(3)	(1)	(1)	(1)	(1)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.				22	23	24	25	26	27	28	29	30	31
Date	Year 1981			8/10	8/10	8/10	8/10	8/11	8/11	8/11	8/11	8/11	8/11
Time				11:51	13:00	15:21	16:45	9:59	10:52	11:25	12:45	13:56	14:45
Purpose of Test				As Found	High Air	Low Air	Low NO_x	As Found	Top OFA 25%	Top OFA 100%	Like 28 Low Air	Like 27 Aux 5-5 Closed	OFA 1 25%
Unit Load	Gross MW			392	394	390	397	393	391	390	395	396	388
Excess Air	L.N.H			N	N.H	L	L	N	N	N	L	N	N
Fuel Elevations in Service				All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr			2758	2745	2754	2754	2759	2762	2767	2768	2739	2776
SHO Temperature	Deg. F			1001	1011	996	1006	1006	998	992	1003	1017	980
RHO Temperature	Deg. F			998	1006	999	1004	997	998	985	1005	1015	968
OFA Nozzle Tilt	Deg. from Hor			0	0	0	+30	0	0	0	0	0	0
Burner Nozzle Tilt	Deg. from Hor			+4	-1	0	0	0	0	0	0	0	0
Offset Angle	Deg. from Fuel			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Windbox Compartment Damper Position - % Open			OFA 2	0	0	0	75	0	25	100	100	25	0
			OFA 1	0	0	0	75	0	0	0	0	0	25
			AUX 0-1	21	26	0	0	24	18	5	0	21	20
		A	COAL 1	100	100	100	60	100	100	100	100	100	100
			AUX 1-2	21	26	0	0	24	18	5	0	21	20
		B	COAL 2	100	100	100	60	100	100	100	100	100	100
			AUX 2-3	21	26	0	0	24	18	5	0	21	20
		C	COAL 3	100	100	100	60	100	100	100	100	100	100
			AUX 3-4	21	26	0	0	24	18	5	0	21	20
		D	COAL 4	100	100	100	60	100	100	100	100	100	100
			OIL 4-5	21	26	0	0	24	18	5	0	21	20
		E	COAL 5	94	93	93	60	93	93	93	93	93	93
			AUX 5-5	60	60	60	0	60	60	60	0	0	0
Flue Gas Oxygen Level	% O_2			4.62	5.48	2.56	3.20	5.40	4.57	4.55	2.24	4.29	4.42
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)			503	496	355	223	BD	457	426	205	439	444
Flue Gas CO Level	PPMV (Adj. to 3% O_2)			17	10	16	428	BD	13	12	15	12	12
NOTES:				(1)	(1)	(1)	(1)	(1),(3)	(1)	(1)	(1),(2)	(1)	(1)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.		32	33	34	35	36	37	38	39	40	41
Date	Year 1981	8/11	8/12	8/12	8/12	8/12	8/12	8/12	8/12	8/13	8/13
Time		15:25	10:20	10:58	11:32	12:22	12:57	14:38	15:27	9:25	10:27
Purpose of Test		OFA 1 100%	B Tilts +20°	As Found	B Tilts -10°	Low NO_2 NO_x	Repeat Test 3	Repeat Test 17	Repeat Test 32	As Found	Low air
Unit Load	Gross MW	390	416	414	415	405	411	417	409	413	411
Excess Air	L.N.H	N	N	N	N	N	L	L.N	N	N	L.N
Fuel Elevations in Service		All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr	2778	2889	2902	2910	2913	2889	2884	2890	2904	2874
SHO Temperature	Deg. F	985	1013	1006	1002	971	999	1018	996	1003	1012
RHO Temperature	Deg. F	977	1022	1018	1008	979	1018	1024	1000	1014	1027
OFA Nozzle Tilt	Deg. from Hor	0	0	0	0	+30	+30	+30	0	0	0
Burner Nozzle Tilt	Deg. from Hor	0	+18	0	-10	-10	-1	-1	0	0	0
Offset Angle	Deg. from Fuel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	OFA 2	0	0	0	0	70	0	0	0	0	0
	OFA 1	100	0	0	0	70	0	0	100	0	0
	AUX 0-1	10	29	29	26	0	0	25	22	29	20
Windbox Compartment	A COAL 1	100	100	100	100	100	100	50	100	100	100
Damper Position - % Open	AUX 1-2	10	29	29	26	0	0	25	22	29	20
	B COAL 2	100	100	100	100	100	100	50	100	100	100
	AUX 2-3	10	29	29	26	0	0	25	22	29	20
	C COAL 3	100	100	100	100	100	100	50	100	100	100
	AUX 3-4	10	29	29	26	0	0	25	22	29	20
	D COAL 4	100	100	100	100	100	100	50	100	100	100
	OIL 4-5	10	29	29	26	0	0	25	22	29	20
	E COAL 5	93	93	93	92	93	93	50	93	92	92
	AUX 5-5	0	60	60	60	0	60	60	0	60	60
Flue Gas Oxygen Level	% O_2	BD	4.88	4.72	5.14	3.02	3.38	3.40	4.38	4.82	3.41
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)	BD	512	465	447	257	382	374	403	457	418
Flue Gas CO Level	PPMV (Adj. to 3% O_2)	BD	13	12	12	43	122	14	11	13	14
NOTES:		(1)	(1)	(1)	(1)	(1)	(1)	(1),(4)	(1)	(1)	(1)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.		42	43	44	45	46	47	48	49	50	51
Date	Year 1981	8/13	8/13	8/13	8/13	8/14	8/14	8/14	8/14	8/14	8/14
Time		11:53	13:04	13:42	14:23	11:50	12:39	13:36	14:18	14:58	15:35
Purpose of Test		Repeat Test 29	Test 6 w/o Aux 5-5	Test 7 with OFA	Test 8 with OFA	Test 45 High Air	Test 46 w/o Aux 5-5	Test 47 Normal Air	OFA Tilts Up	Test 49 Fuel Air	Test 50 No OFA
Unit Load	Gross MW	412	413	414	411	391	391	385	389	391	395
Excess Air	L,N,H	L	N	N	N	H	H	N	N	N	N
Fuel Elevations in Service		All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr	2881	2887	2891	2877	2786	2768	2758	2762	2745	2747
SHO Temperature	Deg. F	1007	1011	1006	1008	997	1006	997	1002	1009	1017
RHO Temperature	Deg. F	1015	1001	1012	1009	979	980	981	986	1003	1017
OFA Nozzle Tilt	Deg. from Hor	0	0	0	0	0	0	0	+30	+30	+30
Burner Nozzle Tilt	Deg. from Hor	0	0	0	0	0	0	0	0	+1	+1
Offset Angle	Deg. from Fuel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	OFA 2	100	25	50	100	100	100	100	100	100	0
	OFA 1	0	25	50	100	100	100	100	100	100	0
	AUX 0-1	0	23	20	8	0	18	0	0	0	29
Windbox Compartment	A COAL 1	100	100	100	100	100	100	100	100	50	50
Damper Position - % Open	AUX 1-2	0	23	20	8	0	18	0	0	0	29
	B COAL 2	100	100	100	100	100	100	100	100	50	50
	AUX 2-3	0	23	20	8	0	18	0	0	0	29
	C COAL 3	100	100	100	100	100	100	100	100	50	50
	AUX 3-4	0	23	20	8	0	18	0	0	0	29
	D COAL 4	100	100	100	100	100	100	100	100	50	50
	OIL 4-5	0	23	20	8	0	18	0	0	0	29
	E COAL 5	93	92	92	92	94	94	94	94	50	50
	AUX 5-5	0	0	0	0	60	0	0	0	0	0
Flue Gas Oxygen Level	% O_2	2.06	4.26	4.10	4.01	5.56	5.53	4.39	3.97	3.83	4.39
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)	302	410	388	360	450	430	360	323	294	396
Flue Gas CO Level	PPMV (Adj. to 3% O_2)	42	25	25	11	11	14	16	18	18	15
NOTES:		(1),(4)	(1),(4)	(1),(4)	(1),(4)	(1)	(1)	(1)	(1)	(1)	(1)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			52	53	54	55	56	57	58	59	60	61
Date	Year 1981		8/17	8/17	8/17	8/17	8/17	8/17	8/17	8/17	8/18	8/18
Time			0:48	1:53	3:11	3:42	4:16	5:30	6:11	23:10	0:20	1:56
Purpose of Test			Load As Found	Load Low Air	Load High Air	Load OFA	Load OFA	Load OFA	Load OFA Tilts	Load Fuel Elev	Load Fuel Elev	Load Fuel Elev
Unit Load	Gross MW		307	299	302	300	300	301	297	299	302	301
Excess Air	L,N,H		N	L,N	H	H	H	N	N	N	N	L,N
Fuel Elevations in Service			BCDE	BCDE	BCDE	BCDE	BCDE	BCDE	BCDE	All 5	ABCD	ABCD
Main Steam Flow	x 10E3 Lb/Hr		2111	2104	2078	2097	2112	2105	2117	2051	2058	2044
SHO Temperature	Deg. F		1007	996	1016	1002	988	989	975	1006	1009	1013
RHO Temperature	Deg. F		978	947	973	953	939	942	923	990	999	1001
OFA Nozzle Tilt	Deg. from Hor		0	0	0	0	0	0	+30	0	0	0
Burner Nozzle Tilt	Deg. from Hor		+15	+10	+10	+10	+10	+10	+10	0	0	0
Offset Angle	Deg. from Fuel		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Windbox Compartment Damper Position - % Open		OFA 2	0	0	0	45	60	40	40	0	0	0
		OFA 1	0	0	0	45	60	40	40	0	0	0
		AUX 0-1	0	0	5	0	0	0	0	0	0	0
	A	COAL 1	46	46	46	46	46	46	46	100	100	100
		AUX 1-2	0	0	5	0	0	0	0	0	0	0
	B	COAL 2	100	100	100	100	100	100	100	100	100	100
		AUX 2-3	0	0	5	0	0	0	0	0	0	0
	C	COAL 3	100	100	100	100	100	100	100	100	100	100
		AUX 3-4	0	0	5	0	0	0	0	0	0	0
	D	COAL 4	100	100	100	100	100	100	100	80	100	100
		OIL 4-5	0	0	5	0	0	0	0	0	0	0
	E	COAL 5	84	84	84	84	84	84	84	72	25	25
		AUX 5-5	60	60	60	60	0	0	0	60	60	60
Flue Gas Oxygen Level	% O_2		5.56	4.20	7.00	6.55	6.39	5.80	5.23	5.13	5.51	4.13
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		456	361	528	392	364	339	327	489	506	416
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		14	11	20	14	14	16	13	15	15	20
NOTES:			(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)		

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			62	63	64
Date	Year 1981		8/18	8/18	8/18
Time			4:02	4:40	5:40
Purpose of Test			Load Fuel Elev	Load Fuel Elev	Load Fuel Elev
Unit Load	Grcss MW		299	298	297
Excess Air	L.N.H		H	H	N
Fuel Elevations in Service			ABCD	ABCD	ABCD
Main Steam Flow	x 10E3 Lb/Hr		2041	2050	2050
SHO Temperature	Deg. F		1006	1002	1002
RHO Temperature	Deg. F		990	970	972
OFA Nozzle Tilt	Deg. from Hor		0	0	0
Burner Nozzle Tilt	Deg. from Hor		0	0	0
Offset Angle	Deg. from Fuel		NA	NA	NA
Windbox Compartment Damper Position - % Open		OFA 2	0	60	40
		OFA 1	0	60	40
		AUX 0-1	8	0	0
	A	COAL 1	100	100	100
		AUX 1-2	8	0	0
	B	COAL 2	100	100	100
		AUX 2-3	8	0	0
	C	COAL 3	100	100	100
		AUX 3-4	8	0	0
	D	COAL 4	99	98	97
		OIL 4-5	8	0	0
	E	COAL 5	25	25	25
		AUX 5-5	60	0	0
Flue Gas Oxygen Level	% O_2		6.62	6.40	5.47
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		596	469	402
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		13	10	12
NOTES:			(1)	(1)	(1)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			101	102	103	104	105	106	107	108	109	110
Date	Year 1981		10/29	10/29	10/30	10/30	10/30	10/30	11/2	11/2	11/2	11/2
Time			14:10	14:54	9:56	10:47	NR	13:10	9:17	10:25	10:50	12:05
Purpose of Test			As Found	Aux Air	Aux Air OFA	Aux 5-5 OFA	As Found	Offset As Found	As Found	Normal Fuel Elev	Normal Low Press	Normal Low Air
Unit Load	Gross MW		402	399	406	405	406	406	403	331	332	332
Excess Air	L,N,H		N	N	N	N	N	N	N	N	N	N
Fuel Elevations in Service			All 5	All 5	All 5	All 5	All 5	All 5	All 5	ABCE	ABCE	ABCE
Main Steam Flow	x 10E3 Lb/Hr		2789	2692	2731	2731	2728	2750	2732	2220	2212	2217
SHO Temperature	Deg. F		994	1012	1006	1003	1007	1002	1003	1004	1007	1003
RHO Temperature	Deg. F		989	1008	1015	1016	1024	1010	1008	991	1007	1001
OFA Nozzle Tilt	Deg. from Hor		0	0	0	0	0	0	0	0	0	0
Burner Nozzle Tilt	Deg. from Hor		-2	-5	-5	-5	0	0	0	0	0	0
Offset Angle	Deg. from Fuel		25	25	25	25	25	33	25	25	25	25
	____	OFA 2	0	0	50	50	0	0	0	0	0	0
	____	OFA 1	0	0	50	50	0	0	0	0	0	0
	____	AUX 0-1	39	50	35	35	38	40	36	20	35	30
Windbox Compartment	A	COAL 1	100	100	100	100	100	100	100	100	100	100
Damper Position - % Open	____	AUX 1-2	39	50	35	35	38	40	36	20	35	30
	B	COAL 2	100	100	100	100	100	100	100	100	100	100
	____	AUX 2-3	39	50	35	35	38	40	36	20	35	30
	C	COAL 3	100	100	100	100	100	100	100	100	100	100
	____	AUX 3-4	39	50	35	35	38	40	36	20	35	30
	D	COAL 4	100	100	100	100	100	100	100	20	25	25
	____	OIL 4-5	39	50	35	35	38	40	36	20	35	30
	E	COAL 5	100	100	100	100	100	100	100	100	100	100
	____	AUX 5-5	50	50	50	0	50	50	50	50	50	50
Flue Gas Oxygen Level	% O_2		3.71	3.40	4.20	3.58	3.82	3.75	3.73	3.57	3.32	2.35
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		376	362	344	323	445	434	446	347	372	293
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		12	12	14	18	11	12	10	12	11	34

NOTES:

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			111	112	113	114	115	116	117	118	119	120
Date	Year 1981		11/2	11/3	11/3	11/3	11/3	11/3	11/3	11/4	11/4	11/4
Time			13:30	9:28	11:00	14:05	14:46	15:19	16:16	10:27	10:56	11:31
Purpose of Test			W.B. Press	Repeat 111	Low Air	Oil 4-5 Dampers	114, with High Air	OFA High Air	OFA Normal Air	Aux 5-5 Oil 4-5 Closed	118 with 50% Fuel Air	118 with 20% Fuel Air
Unit Load	Gross MW		407	403	405	395	398	401	406	400	401	398
Excess Air	L,N,H		N	N	L	N	H	H	N	N	N	N
Fuel Elevations in Service			All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr		2746	2728	2729	2747	2715	2700	2732	2731	2732	2728
SHO Temperature	Deg. F		1001	1004	1002	980	1006	1024	991	1005	1003	1002
RHO Temperature	Deg. F		1015	1007	1010	970	998	1018	984	996	998	991
OFA Nozzle Tilt	Deg. from Hor		0	0	0	0	0	0	0	0	0	0
Burner Nozzle Tilt	Deg. from Hor		0	0	0	0	0	0	0	0	0	0
Offset Angle	Deg. from Fuel		25	25	25	25	25	25	25	25	25	25
Windbox Compartment Damper Position - % Open		OFA 2	0	0	0	0	0	100	100	0	0	0
		OFA 1	0	0	0	0	0	100	100	0	0	0
		AUX 0-1	48	50	41	55	56	38	30	50	53	55
	A	COAL 1	100	100	100	100	100	100	100	100	100	100
		AUX 1-2	48	50	41	55	56	38	30	50	53	55
	B	COAL 2	100	100	100	100	100	100	100	100	50	20
		AUX 2-3	48	50	41	55	56	38	30	50	53	55
	C	COAL 3	100	100	100	100	100	100	100	100	50	20
		AUX 3-4	48	50	41	55	56	38	30	50	53	55
	D	COAL 4	100	100	100	100	100	100	100	100	50	20
		OIL 4-5	48	50	41	0	0	0	0	0	0	0
	E	COAL 5	100	100	90	94	96	97	97	80	50	20
		AUX 5-5	50	50	50	10	10	10	10	0	0	0
Flue Gas Oxygen Level	% O_2		3.07	3.26	2.36	3.78	NR	5.26	3.72	3.55	3.50	3.76
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		407	426	383	426	NR	373	272	406	416	406
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		12	12	12	11	NR	12	36	11	11	11
											(5)	(5)

NOTES:

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			121	122	123	124	125	126	127	128	129	130
Date	Year 1981		11/04	11/04	11/04	11/04	11/05	11/05	11/05	11/05	11/6	11/6
Time			13:17	15:05	15:50	16:18	9:40	11:05	12:43	16:17	9:20	9:50
Purpose of Test			Fuel Air Oil 4-5	121 with Offset 33°	122 Vary Fuel Air	122 Vary Aux	As Found	Aux 2-3, 4-5, 5-5 Closed	126 with 17° Offset	Repeat 126	Open Aux 2-3	129 with Closed Fuel Air
Unit Load	Gross MW		395	393	394	399	405	412	412	426	420	416
Excess Air	L,N,H		N	N	N	N	N	N	N	N	N	N
Fuel Elevations in Service			All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr		2740	2792	2761	2719	2746	2886	2901	2923	2973	2893
SHO Temperature	Deg. F		964	954	979	1010	1004	977	968	1000	1002	984
RHO Temperature	Deg. F		941	930	958	1001	1001	971	964	999	1008	991
OFA Nozzle Tilt	Deg. from Hor		0	0	0	0	0	0	0	0	0	0
Burner Nozzle Tilt	Deg. from Hor		0	0	0	0	0	+6	+5	+10	-2	+12
Offset Angle	Deg. from Fuel		25	33	33	33	33	33	17	33	33	33
Windbox Compartment Damper Position - % Open		OFA 2	0	0	0	0	0	0	0	0	0	0
		OFA 1	0	0	0	0	0	0	0	0	0	0
		AUX 0-1	100	100	100	53	40	100	100	70	60	40
	A	COAL 1	100	100	100	100	100	100	100	100	100	100
		AUX 1-2	100	100	100	53	40	100	100	70	60	40
	B	COAL 2	20	20	50	50	100	100	100	100	100	20
		AUX 2-3	100	100	100	53	40	0	0	0	60	40
	C	COAL 3	20	20	50	50	100	100	100	100	100	100
		AUX 3-4	100	100	100	53	40	100	100	70	60	40
	D	COAL 4	20	20	50	50	100	100	100	100	100	20
		OIL 4-5	0	0	0	0	40	0	0	0	0	0
	E	COAL 5	20	20	50	50	100	100	100	100	100	20
		AUX 5-5	0	0	0	0	50	0	0	0	0	0
Flue Gas Oxygen Level	% O_2		3.70	3.82	3.99	3.78	3.82	4.12	4.38	3.79	3.88	4.10
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		374	355	408	423	462	423	397	385	445	353
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		12	12	12	12	10	11	12	17	10	16
NOTES:			(5)	(5)	(5)	(5)						(5)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			131	132	133	134	135	136	137	138	139	140
Date	Year 1981		11/6	11/6	11/6	11/6	11/9	11/9	11/9	11/9	11/9	11/9
Time			10:45	11:42	12:48	14:20	11:46	12:40	13:38	14:05	15:03	15:55
Purpose of Test			Aux 4-5, 5-5 Closed Fuel Air	Low Air	Test Aborted	OFA High Air	OFA Fuel Air	OFA Fuel Air	Aux Damper	Aux Damper	Normal Aux	Open Aux 5-5
Unit Load	Gross MW		426	429	430	419	430	421	423	425	424	421
Excess Air	L,N,H		L	L	N	H	N	N	N	N	N	N
Fuel Elevations in Service			All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr		2908	2918	NR	2893	2918	2883	2900	2910	2915	2912
SHO Temperature	Deg. F		1012	1000	NR	1013	1011	1004	999	996	998	984
RHO Temperature	Deg. F		1003	1003	NR	996	1007	1001	1001	1001	1000	989
OFA Nozzle Tilt	Deg. from Hor		0	0	0	0	0	0	0	0	0	0
Burner Nozzle Tilt	Deg. from Hor		20	-11	0	+10	+23	+25	+25	+23	+21	-1
Offset Angle	Deg. from Fuel		33	33	33	33	33	17	17	17	17	17
Windbox Compartment Damper Position - % Open		OFA 2	0	0	0	50	25	20	0	0	0	0
		OFA 1	0	0	0	50	25	20	0	0	0	0
		AUX 0-1	100	50	100	65	100	100	100	45	68	60
	A	COAL 1	100	100	100	100	100	100	100	100	100	100
		AUX 1-2	100	50	100	65	100	100	100	45	68	60
	B	COAL 2	10	100	100	100	10	10	10	10	20	10
		AUX 2-3	100	50	100	65	100	100	100	45	68	60
	C	COAL 3	10	100	100	100	10	10	10	10	20	10
		AUX 3-4	100	50	100	65	100	100	100	45	68	60
	D	COAL 4	10	100	100	100	10	10	10	10	20	10
		OIL 4-5	0	0	0	0	0	0	0	0	0	0
	E	COAL 5	10	100	100	100	10	10	10	10	20	10
		AUX 5-5	0	0	0	0	0	0	0	0	0	25
Flue Gas Oxygen Level	% O_2		3.25	2.95	NR	4.82	4.10	4.00	4.06	4.09	4.20	4.02
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		245	392	NR	391	252	296	311	318	335	418
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		724	13	NR	13	580	265	172	122	53	14
NOTES:			(5)		Aborted Due to High Fan Pressure		(5)	(5)	(5)	(5)	(5)	(5)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			141	142	143	144	145	146	147	148	149	150
Date	Year 1981		11/9	11/10	11/10	11/10	11/10	11/10	11/11	11/11	11/11	11/11
Time			10:25	11:40	12:23	13:48	15:00	16:10	8:53	9:43	10:35	11:25
Purpose of Test			33% Offset	Aux 5-5 100%	Fuel Air	17° Offset	Excess Air	Fuel Air	As Found	Load	Close Fuel Air	Repeat 144
Unit Load	Gross MW		422	424	421	423	423	420	402	428	421	424
Excess Air	L,N,H		N	N	N	N	L	N	N			
Fuel Elevations in Service			All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr		2870	2903	2882	2892	2907	2892	2726	2936	2915	2909
SHO Temperature	Deg. F		1009	1004	1004	1003	997	993	1008	1003	995	1005
RHO Temperature	Deg. F		1005	1000	1000	NR	1004	993	1011	1004	992	999
OFA Nozzle Tilt	Deg. from Hor		0	0	0	0	0	0	0	0	0	0
Burner Nozzle Tilt	Deg. from Hor		+18	+19	+20	+25	+18	+23	0	0	+7	+24
Offset Angle	Deg. from Fuel		33	33	33	17	17	17	17	17	17	17
Windbox Compartment Damper Position - % Open		OFA 2	0	0	0	0	0	0	0	0	0	0
		OFA 1	0	0	0	0	0	0	0	0	0	0
		AUX 0-1	100	97	100	100	66	87	38	56	67	100
	A	COAL 1	100	100	10	10	10	15	50	50	20	10
		AUX 1-2	100	97	100	100	66	87	38	56	67	100
	B	COAL 2	10	10	10	10	10	15	50	50	20	10
		AUX 2-3	100	97	100	100	66	87	38	56	67	100
	C	COAL 3	10	10	10	10	10	15	50	50	20	10
		AUX 3-4	100	97	100	100	66	87	38	56	67	100
	D	COAL 4	10	10	10	10	10	15	50	50	20	10
		OIL 4-5	0	0	0	0	0	0	38	0	0	0
	E	COAL 5	10	10	10	10	10	15	50	50	20	10
		AUX 5-5	25	100	100	100	100	100	50	100	100	100
Flue Gas Oxygen Level	% O_2		4.28	4.56	4.53	4.83	3.80	5.10	4.22	4.48	4.67	5.46
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		304	316	317	315	335	387	494	477	442	398
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		140	84	83	98	67	54	23	102	47	107
NOTES:			(5)	(5)	(6)	(6)	(6)	(6)			(6)	

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			151	152	153	154	155	156	157	158	159	160
Date	Year 1981		11/11	11/12	11/12	11/12	11/12	11/12	11/12	11/12	11/12	11/12
Time			14:35	15:21	10:37	11:15	11:35	11:45	12:31	NR	13:15	13:38
Purpose of Test			Repeat 145	Repeat 148	Fuel Air	Fuel Air	Repeat 150	Fuel Air	Offset	Fuel Air	Fuel Air	Fuel Air
Unit Load	Gross MW		425	422	428	425	424	426	426	424	426	424
Excess Air	L,N,H		N	N	N	N	N	N	N	N	N	N
Fuel Elevations in Service			All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr		2943	2930	2919	2913	2917	2921	2914	2903	2925	2925
SHO Temperature	Deg. F		998	988	1005	999	997	997	1000	1005	996	989
RHO Temperature	Deg. F		987	982	1009	1005	999	1008	1010	1012	994	993
OFA Nozzle Tilt	Deg. from Hor		0	0	0	0	0	0	0	0	0	0
Burner Nozzle Tilt	Deg. from Hor		+28	+20	+17	+14	+13	0	-9	-4	-11	-8
Offset Angle	Deg. from Fuel		17	17	17	17	17	17	25	25	25	25
Windbox Compartment Damper Position - % Open		OFA 2	0	0	0	0	0	0	0	0	0	0
		OFA 1	0	0	0	0	0	0	0	0	0	0
		AUX 0-1	80	63	46	50	60	45	46	50	53	60
	A	COAL 1	10	20	50	20	10	100	100	50	20	10
		AUX 1-2	80	63	46	50	60	45	46	50	53	60
	B	COAL 2	10	20	50	20	10	100	100	50	20	10
		AUX 2-3	80	63	46	50	60	45	46	50	53	60
	C	COAL 3	10	20	50	20	10	100	100	50	20	10
		AUX 3-4	80	63	46	50	60	45	46	50	53	60
	D	COAL 4	10	20	50	20	10	100	100	50	20	10
		OIL 4-5	0	0	0	0	0	0	0	0	0	0
	E	COAL 5	10	20	50	20	10	90	90	50	20	10
		AUX 5-5	100	100	100	100	100	100	100	100	100	100
Flue Gas Oxygen Level	% O_2		2.60	2.55	.60	3.49	3.42	3.38	3.63	3.71	3.65	3.58
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		304	335	324	306	320	394	452	441	420	402
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		31	22	132	257	194	18	19	21	13	22
NOTES:			(6)	(6)	(6)	(6)	(6)			(6)	(6)	(6)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			161	162	163	164	165	166	167	168	169	170
Date	Year 1981		11/12	11/12	11/12	11/12	11/13	11/13	11/13	11/13	11/13	11/13
Time			14:38	15:00	15:24	16:01			13:07	14:10	14:50	15:20
Purpose of Test			Offset 33°	Fuel Air	Fuel Air	Fuel Air	Data Lost	Data Lost	162 with High Air	161 with High Air	Repeat 166	Repeat 165
Unit Load	Gross MW		421	426	424	427	419	422	422	418	424	426
Excess Air	L,N,H		N	N	N	N			H	H	H	H
Fuel Elevations in Service			All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr		2909	2905	2901	2902			2929	2927	2904	2928
SHO Temperature	Deg. F		1002	1015	1005	1007			999	989	1010	1000
RHO Temperature	Deg. F		998	1012	1015	1010			990	979	1015	1001
OFA Nozzle Tilt	Deg. from Hor		0	0	0	0	0	0	0	0	0	0
Burner Nozzle Tilt	Deg. from Hor		+20	+14	0	-18	419	+19	+19	+19	+16	+6
Offset Angle	Deg. from Fuel		33	33	33	33	33	33	33	33	33	33
		OFA 2	0	0	0	0	0	0	0	0	0	0
		OFA 1	0	0	0	0	0	0	0	0	0	0
		AUX 0-1	100	94	58	50	100	71	80	100	60	60
Windbox Compartment	A	COAL 1	10	20	50	100	100	50	20	10	50	100
Damper Position - % Open		AUX 1-2	100	94	58	50	100	71	80	100	60	60
	B	COAL 2	10	20	50	100	100	50	20	10	50	100
		AUX 2-3	100	94	58	50	100	71	80	100	60	60
	C	COAL 3	10	20	50	100	100	50	20	10	50	100
		AUX 3-4	100	94	58	50	100	71	80	100	60	60
	D	COAL 4	10	20	50	100	100	50	20	10	50	100
		OIL 4-5	0	0	0	0	0	0	0	0	0	0
	E	COAL 5	10	20	50	100	100	50	20	10	50	100
		AUX 5-5	100	100	100	100	100	100	100	100	100	100
Flue Gas Oxygen Level	% O_2		4.30	4.06	3.84	3.45	5.54	4.43	4.14	4.08	4.00	4.46
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		280	313	426	465	390	366	309	271	360	430
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		416	236	22	22	NR	NR	276	464	53	14
NOTES:			(6)	(6)	(6)		(7)	(7)	(6)	(6)	(6)	

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.		171	172	173	174	175	176	177	178	179	180
Date Time	Year 1981	11/16 9:23	11/16 9:43	11/16 10:03	11/16 10:20	11/16 11:23	11/16 11:59	11/16 12:13	11/16 12:42	11/16 14:38	11/16 15:06
Purpose of Test		Offset 25°	Fuel Air High Air	Fuel Air High Air	OFA Fuel Air	OFA Low Air	Normal Air	Low Air	Low Air	Offset 17° High Air	High Air
Unit Load	Gross MW	424	423	420	424	424	422	425	426	425	425
Excess Air	L.N.H	H	H	H	H	L	L.N	L	L	H	H
Fuel Elevations in Service		All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr	2920	2917	2928	2916	2914	2915	2929	2923	2915	2940
SHO Temperature	Deg. F	1003	1000	991	1006	1002	996	1003	1004	1001	997
RHO Temperature	Deg. F	992	988	974	1000	1005	986	995	1007	1007	989
OFA Nozzle Tilt	Deg. from Hor	0	0	0	0	0	0	0	0	0	0
Burner Nozzle Tilt	Deg. from Hor	+12	+20	+20	+19	+15	+19	+21	+20	+2	0
Offset Angle	Deg. from Fuel	25	25	25	25	25	25	25	25	17	17
Windbox Compartment Damper Position - % Open	OFA 2	0	0	0	100	100	0	0	0	0	0
	OFA 1	0	0	0	0	0	0	0	0	0	0
	AUX 0-1	53	65	75	53	47	72	60	50	50	55
	A COAL 1	50	20	10	10	10	10	20	50	50	20
	AUX 1-2	53	65	75	53	47	72	60	50	50	55
	B COAL 2	50	20	10	10	10	10	20	50	50	20
	AUX 2-3	53	65	75	53	47	72	60	50	50	55
	C COAL 3	50	20	10	10	10	10	20	50	50	20
	AUX 3-4	53	65	75	53	47	72	60	50	50	55
	D COAL 4	50	20	10	10	10	10	20	50	50	20
	OIL 4-5	0	0	0	0	0	0	0	0	0	0
	E COAL 5	50	20	10	10	10	10	20	50	50	20
	AUX 5-5	100	100	100	100	100	100	100	100	100	100
Flue Gas Oxygen Level	% O_2	5.15	5.18	5.21	5.33	4.58	5.25	5.05	5.16	4.80	4.75
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)	397	313	283	284	279	275	299	363	435	406
Flue Gas CO Level	PPMV (Adj. to 3% O_2)	11	258	450	140	236	666	600	175	10	15
NOTES:		(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			181	182	183	184	185	186	187
Date	Year 1981		11/16	11/17	11/17	11/17	11/17	11/17	11/17
Time			15:30	11:12	12:24	12:46	15:10	15:40	NR
Purpose of Test			High Air	Gas Taps	Gas Taps	Gas Taps	Gas Taps	Offset 22°	Offset 22°
Unit Load	Gross MW		421	423	416	413	413	421	420
Excess Air	L,N,H		H	H	H	H	H	NR	N
Fuel Elevations in Service			All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr		2932	2926	2964	2935	2918	2907	2914
SHO Temperature	Deg. F		989	998	960	974	979	1002	1001
RHO Temperature	Deg. F		985	990	944	953	963	994	988
OFA Nozzle Tilt	Deg. from Hor		0	0	0	0	0	0	0
Burner Nozzle Tilt	Deg. from Hor		+3	+20	+18	+19	+19	+23	+19
Offset Angle	Deg. from Fuel		17	17	33	33	25	22	22
Windbox Compartment Damper Position - % Open		OFA 2	0	0	0	0	0	0	0
		OFA 1	0	0	0	0	0	0	0
		AUX 0-1	62	70	100	100	89	91	64
	A	COAL 1	10	20	10	20	20	10	10
		AUX 1-2	62	70	100	100	89	91	64
	B	COAL 2	10	20	10	20	20	10	10
		AUX 2-3	62	70	100	100	89	91	64
	C	COAL 3	10	20	10	20	20	10	10
		AUX 3-4	62	70	100	100	89	91	64
	D	COAL 4	10	20	10	20	20	10	10
		OIL 4-5	0	0	0	0	0	0	0
	E	COAL 5	10	20	10	100	20	10	10
		AUX 5-5	100	100	100	100	100	100	100
Flue Gas Oxygen Level	% O_2		4.72	6.28	6.31	6.27	5.99	5.80	4.95
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		373	324	338	342	342	323	281
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		11	20	71	34	76	152	414
NOTES:			(6)	(6)	(6)	(6)	(6)	(6)	(6)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.		201	202	203	204	205	206	207	208	209	210
Date	Year 1982	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/17	3/17
Time		11:15	13:44	14:37	15:15	16:25	17:09	17:37	18:00	10:32	11:04
Purpose of Test		Matrix 42	Matrix 41	Matrix 17	Matrix 18	Matrix 19	Matrix 15	Matrix 16	Matrix 32	Matrix 32	Matrix 33
Unit Load	Gross MW	418	428	427	418	414	419	424	423	425	422
Excess Air	L.N.H	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Fuel Elevations in Service		All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr	2984	2931	2924	2896	2991	2958	2932	2922	2905	2915
SHO Temperature	Deg. F	954	1012	1008	960	945	976	1006	997	1017	1004
RHO Temperature	Deg. F	952	1012	1011	958	940	969	1005	1009	1022	1006
OFA Nozzle Tilt	Deg. from Hor	0	0	0	0	0	0	0	0	0	0
Burner Nozzle Tilt	Deg. from Hor	0	0	0	0	0	0	0	0	0	0
Offset Angle	Deg. from Fuel	25	25	25	25	25	25	25	25	25	25
Windbox Compartment Damper Position - % Open	OFA 2	0	100	100	100	100	100	100	100	50	50
	OFA 1	0	100	100	100	100	100	100	100	50	50
	AUX 0-1	70	45	47	49	56	70	42	48	44	45
	A COAL 1	100	100	50	20	10	100	100	100	100	50
	AUX 1-2	70	45	47	49	56	70	42	48	44	45
	B COAL 2	100	100	50	20	10	100	100	100	100	50
	AUX 2-3	70	45	47	49	56	70	42	48	44	45
	C COAL 3	100	100	50	20	10	100	100	100	100	50
	AUX 3-4	70	45	47	49	56	70	42	48	44	45
	D COAL 4	100	100	50	20	10	100	100	100	100	100
	OIL 4-5	0	0	0	0	0	0	0	0	0	0
	E COAL 5	100	100	50	20	10	10	100	100	100	50
	AUX 5-5	0	0	0	0	0	0	0	0	0	0
Flue Gas Oxygen Level	% O_2	4.15	3.79	4.08	4.14	4.21	4.16	3.80	3.98	3.55	3.65
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)	458	327	323	309	296	323	303	341	325	311
Flue Gas CO Level	PPMV (Adj. to 3% O_2)	15	32	34	14	11	18	68	16	66	31

NOTES:

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			211	212	213	214	215	216	217	218	219	220
Date	Year 1982		3/17	3/17	3/17	3/17	3/17	3/17	3/18	3/18	3/18	3/18
Time			11:33	12:31	13:17	14:31	16:09	16:35	11:09	11:44	12:29	14:55
Purpose of Test			Matrix 34	Matrix 35	Matrix 36	Matrix 37	Matrix 38	Matrix 38A	Matrix 38 Repeat	Matrix 21	Matrix 20	Matrix 23
Unit Load	Gross MW		420	414	426	418	424	422	420	424	420	416
Excess Air	L,N,H		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Fuel Elevations in Service			All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr		2957	2947	2932	2900	2900	2929	2890	2898	2912	2954
SHO Temperature	Deg. F		976	964	1000	1011	1016	994	1013	1009	997	969
RHO Temperature	Deg. F		984	964	1007	999	1018	997	1022	1009	1003	970
OFA Nozzle Tilt	Deg. from Hor		0	0	-10	+10	+30	+30	+30	+30	+30	+30
Burner Nozzle Tilt	Deg. from Hor		0	0	-15	+9	0	-15	0	+10	-15	-15
Offset Angle	Deg. from Fuel		25	25	25	25	25	25	25	25	25	25
Windbox Compartment Damper Position - % Open		OFA 2	50	50	100	100	100	100	100	100	100	100
		OFA 1	50	50	100	100	100	100	100	100	100	100
		AUX 0-1	51	60	46	44	40	40	37	40	37	52
	A	COAL 1	20	10	100	100	100	100	100	100	100	11
		AUX 1-2	51	60	46	44	40	40	37	40	37	52
	B	COAL 2	20	10	100	100	100	100	100	100	100	11
		AUX 2-3	51	60	46	46	40	40	37	40	37	52
	C	COAL 3	20	10	100	100	100	100	100	100	100	11
		AUX 3-4	51	60	46	46	40	40	37	40	37	52
	D	COAL 4	20	10	100	100	100	100	100	100	100	11
		OIL 4-5	0	0	0	0	0	0	0	0	0	0
	E	COAL 5	20	10	100	100	100	100	100	100	100	11
		AUX 5-5	0	0	0	0	0	0	0	0	0	0
Flue Gas Oxygen Level	% O_2		3.67	3.90	4.64	3.96	3.13	3.56	3.44	3.44	3.66	4.14
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		307	300	403	287	246	284	277	256	274	301
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		17	22	11	192	493	15	393	495	22	26

NOTES:

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.				221	222	223	224	225	226	227	228	229	230
Date	Year 1982			3/18	3/18	3/19	3/19	3/19	3/19	3/19	3/19	3/22	3/22
Time				15:34	16:18	11:31	12:17	14:00	15:18	15:46	16:03	12:24	13:18
Purpose of Test				Matrix 24	Matrix 25	Matrix 20	Matrix 26	Matrix 27	Matrix 31	Matrix 30	Matrix 29	Matrix 31B	Matrix 32 Repeat
Unit Load	Gross MW			425	428	420	420	421	416	411	410	421	426
Excess Air	L.N.H			NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Fuel Elevations in Service				All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr			2901	2908	2912	2915	2913	2925	2939	2985	2892	2894
SHO Temperature	Deg. F			1012	1005	1004	1001	1006	987	970	936	1003	1023
RHO Temperature	Deg. F			1017	1016	1007	1003	1001	976	961	939	1009	1018
OFA Nozzle Tilt	Deg. from Hor			+30	+30	+30	+30	+30	+30	+30	+30	0	+30
Burner Nozzle Tilt	Deg. from Hor			+10	+20	-15	-15	+10	+20	+10	-15	+18	+20
Offset Angle	Deg. from Fuel			25	25	25	25	25	25	25	25	25	25
Windbox Compartment Damper Position - % Open			OFA 2	100	100	100	100	100	100	100	100	100	100
			OFA 1	100	100	100	100	100	100	100	100	100	100
			AUX 0-1	56	56	39	45	48	70	67	66	55	52
		A	COAL 1	11	11	100	100	100	10	10	10	10	10
			AUX 1-2	56	56	39	45	48	70	67	66	55	52
		B	COAL 2	11	11	100	100	100	10	10	10	10	10
			AUX 2-3	56	56	39	45	48	70	67	66	55	52
		C	COAL 3	11	11	100	100	100	10	10	10	10	10
			AUX 3-4	56	56	39	45	48	70	67	66	55	52
		D	COAL 4	11	11	100	100	100	10	10	10	10	10
			OIL 4-5	0	0	0	0	0	0	0	0	0	0
		E	COAL 5	11	11	100	100	100	10	10	10	10	10
			AUX 5-5	0	0	0	0	0	0	0	0	0	0
Flue Gas Oxygen Level	% O_2			4.07	3.73	4.46	4.64	4.65	4.88	5.05	5.00	4.55	4.30
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)			244	224	327	383	306	245	236	366	298	247
Flue Gas CO Level	PPMV (Adj. to 3% O_2)			416	2973	15	28	157	894	43	16	193	1285

NOTES:

(NA) Not Applicable   (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			231	232	233	234	235	236	237	238	239	240
Date	Year 1982		3/22	3/22	3/22	3/22	3/22	3/23	3/23	3/23	3/23	3/23
Time			14:44	15:10	15:58	16:18	16:50	11:20	12:30	13:53	14:38	14:57
Purpose of Test			Matrix 4	Matrix 3	Matrix 2	Matrix 1	Matrix 5	Matrix 1R	Matrix 11	Matrix 12	Matrix 13	Matrix 14
Unit Load	Gross MW		417	422	428	427	421	420	420	417	415	415
Excess Air	L,M,H		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Fuel Elevations in Service			All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr		2909	2887	2905	2895	2898	2852	2903	2877	2927	2940
SHO Temperature	Deg. F		993	1013	1010	1009	1006	1024	996	1003	973	965
RHO Temperature	Deg. F		991	1020	1020	1026	1008	1017	997	1010	975	963
OFA Nozzle Tilt	Deg. from Hor		0	0	0	0	0	0	0	0	0	0
Burner Nozzle Tilt	Deg. from Hor		0	0	0	0	0	0	0	0	0	0
Offset Angle	Deg. from Fuel		17	17	17	17	17	17	33	33	33	33
Windbox Compartment Damper Position - % Open		OFA 2	100	100	100	100	100	100	100	100	100	100
		OFA 1	100	100	100	100	100	100	100	100	100	100
		AUX 0-1	52	46	39	36	60	35	44	45	50	56
	A	COAL 1	10	20	50	100	100	100	100	50	20	10
		AUX 1-2	52	46	39	36	60	35	44	45	50	56
	B	COAL 2	10	20	50	100	100	100	100	50	20	10
		AUX 2-3	52	46	39	36	60	35	44	45	50	56
	C	COAL 3	10	20	50	100	100	100	100	50	20	10
		AUX 3-4	52	46	39	36	60	35	44	45	50	56
	D	COAL 4	10	20	50	100	100	100	100	50	20	10
		OIL 4-5	0	0	0	0	0	0	0	0	0	0
	E	COAL 5	10	20	50	100	100	100	100	50	20	10
		AUX 5-5	0	0	0	0	0	0	0	0	0	0
Flue Gas Oxygen Level	% O_2		4.38	4.29	4.08	3.37	4.15	3.79	4.58	4.88	4.96	4.86
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		287	296	295	270	299	268	346	337	334	347
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		31	20	90	626	37	1122	45	41	23	16

NOTES:

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.		241	242	243	244	245	246	247	248	249	250
Date	Year 1982	3/23	3/23	3/24	3/24	3/24	3/24	3/24	3/24	3/24	3/29
Time		15:41	16:06	12:57	14:29	15:21	15:54	16:31	17:02	17:23	NR
Purpose of Test		Matrix 14b	Matrix 43	Matrix 43R	Matrix 7	Matrix 7A	Matrix 7R	Matrix 8	Matrix 9	Matrix 10	High Vel
Unit Load	Gross MW	425	425	409	411	411	411	410	412	410	NR
Excess Air	L,M,H	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Fuel Elevations in Service		All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr	2924	2894	2845	2837	2864	2829	2838	2855	2856	NR
SHO Temperature	Deg. F	1000	1006	1002	1009	990	1009	997	992	990	NR
RHO Temperature	Deg. F	1015	1013	1004	1012	996	1006	1003	1000	994	NR
OFA Nozzle Tilt	Deg. from Hor	0	0	0	0	0	0	0	0	0	0
Burner Nozzle Tilt	Deg. from Hor	0	0	0	0	0	0	0	0	0	0
Offset Angle	Deg. from Fuel	33	33	33	33	33	33	33	33	33	17
	OFA 2	100	0	0	100	100	100	100	100	100	0
	OFA 1	100	0	0	100	100	100	100	100	100	0
	AUX 0-1	40	48	46	34	29	35	36	40	47	100
Windbox Compartment	A COAL 1	10	100	100	100	100	100	50	20	10	100
Damper Position - % Open	AUX 1-2	40	48	46	34	29	35	36	40	47	100
	B COAL 2	10	100	100	100	100	100	50	20	10	100
	AUX 2-3	40	48	46	34	29	35	36	40	47	100
	C COAL 3	10	100	100	100	100	100	50	20	10	0
	AUX 3-4	40	48	46	34	29	35	36	40	47	100
	D COAL 4	10	100	100	100	100	100	50	20	10	100
	OIL 4-5	40	48	46	0	0	0	0	0	0	0
	E COAL 5	10	100	100	100	100	100	50	20	10	100
	AUX 5-5	50	50	50	0	100	0	0	0	0	0
Flue Gas Oxygen Level	% O_2	4.56	4.13	4.35	4.69	3.70	4.03	4.19	4.30	4.78	2.39
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)	346	489	385	290	261	256	269	266	260	353
Flue Gas CO Level	PPMV (Adj. to 3% O_2)	15	12	23	860	271	2250	1299	272	217	18

NOTES:

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.				251	252	253	254	255	256	257	258	259	260
Date	Year 1982			3/29	3/29	3/29	3/29	3/29	3/30	3/30	3/30	3/30	3/30
Time				NR	NR	NR	NR	NR	9:48	11:54	12:47	13:39	15:05
Purpose of Test				High Vel OFA	High Vel	High Vel	Repeat 234,236	Repeat 234,236	Repeat 254	Btilts	Btilts	High Air	Open Aux 5-5
Unit Load	Gross MW			NR	NR	NR	413	418	423	433	432	434	425
Excess Air	L.N.H			NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Fuel Elevations in Service				All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr			NR	NR	NR	2859	NR	2750	2750	2750	2750	2750
SHO Temperature	Deg. F			NR	NR	NR	990	NR	990	1000	1000	1000	1000
RHO Temperature	Deg. F			NR	NR	NR	NR	NR	1000	1010	1020	1015	1010
OFA Nozzle Tilt	Deg. from Hor			0	0	0	+30	+30	+30	+30	+30	+30	+30
Burner Nozzle Tilt	Deg. from Hor			0	0	0	0	-15	0	-13	0	0	0
Offset Angle	Deg. from Fuel			17	33	17	17	17	17	25	25	25	17
Windbox Compartment Damper Position - % Open			OFA 2	100	0	0	100	100	100	100	100	100	100
			OFA 1	100	0	0	100	100	100	100	100	100	100
			AUX 0-1	65	100	100	35	30	43	36	35	35	30
		A	COAL 1	100	100	100	100	100	100	100	100	100	100
			AUX 1-2	65	100	100	35	30	43	36	35	35	30
		B	COAL 2	100	100	100	100	100	100	100	100	100	100
			AUX 2-3	65	100	100	35	30	43	36	35	35	30
		C	COAL 3	100	100	100	100	100	100	100	100	100	100
			AUX 3-4	0	0	0	35	30	43	36	35	35	30
		D	COAL 4	100	100	100	100	100	100	100	100	100	100
			OIL 4-5	40	48	46	0	0	0	0	0	0	0
		E	COAL 5	10	100	100	100	100	100	100	100	100	100
			AUX 5-5	50	50	50	0	0	0	0	0	0	0
Flue Gas Oxygen Level	% O_2			4.46	3.95	4.03	3.92	3.61	4.30	3.37	3.70	4.08	4.07
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)			296	452	373	269	247	299	269	263	287	266
Flue Gas CO Level	PPMV (Adj. to 3% O_2)			38	14	15	154	194	43	329	438	179	70

NOTES:

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			261	262	263	264	265	266	268	269
Date	Year 1982		3/30	3/30	3/30	3/30	3/30	3/31	3/31	3/31
Time			NR	NR	16:38	17:35	18:07		17:36	18:07
Purpose of Test			Cofirm 213	Repeat 261	Aux 5-5 Closed	Open Oil 4-5	Aux 5-5 50%	Same	Aux 5-5 Closed	Same
Unit Load	Gross MW		420	420	426	419	419	385	420	420
Excess Air	L,N,H		NR	NR	NR	NR	NR	NR	NR	NR
Fuel Elevations in Service			All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr		NR	NR	NR	2848	2862	NR	2885	2886
SHO Temperature	Deg. F		NR	NR	NR	1000	992	NR	998	998
RHO Temperature	Deg. F		NR	NR	NR	1021	1013	NR	1001	1003
OFA Nozzle Tilt	Deg. from Hor		+30	+30	+30	+30	+30	+30	+30	+30
Burner Nozzle Tilt	Deg. from Hor		-15	-15	-15	-15	-15	-15	-23	-23
Offset Angle	Deg. from Fuel		17	17	17	17	17	17	17	17
Windbox Compartment Damper Position - % Open		OFA 2	100	100	100	100	100	100	100	100
		OFA 1	100	100	100	100	100	100	100	100
		AUX 0-1	26	26	30	26	20	12	30	30
	A	COAL 1	100	100	100	100	100	100	100	100
		AUX 1-2	26	26	30	26	20	12	30	30
	B	COAL 2	100	100	100	100	100	100	100	100
		AUX 2-3	26	26	30	26	20	12	30	30
	C	COAL 3	100	100	100	100	100	100	100	100
		AUX 3-4	26	26	30	26	20	12	30	30
	D	COAL 4	100	100	100	100	100	100	100	100
		OIL 4-5	0	0	0	26	20	12	30	30
	E	COAL 5	10	100	100	100	100	100	100	100
		AUX 5-5	50	50	0	0	50	50	0	0
Flue Gas Oxygen Level	% O_2		4.19	4.21	3.87	3.92	4.29	3.81	4.42	4.51
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		242	246	251	235	255	220	266	257
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		8	28	268	100	26	39	29	31

NOTES:

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			301	302	303	304	305	306	307	308	309	310
Date	Year 1982		9/20	9/20	9/20	9/20	9/20	9/20	9/20	9/20	9/22	9/22
Time												
Purpose of Test			Matrix 2	Matrix 1,4	Matrix 4	Matrix 1,4	Matrix 5	Matrix 8	Matrix 9	Matrix 6	As Found	Matrix 12
Unit Load	Gross MW		402	398	399	399	398	400	401	402	415	412
Excess Air	L,N,H		N	N	L,N	L,N	L,N	N	N,H	N	N	N
Fuel Elevations in Service			All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr		2500	2510	2550	2550	2550	2550	2550	2550	2700	2650
SHO Temperature	Deg. F		1005	987	997	1002	1001	1005	1005	1000	1005	1005
RHO Temperature	Deg. F		1000	995	1050	1000	1000	1000	1000	1013	1009	1008
OFA Nozzle Tilt	Deg. from Hor		+30	+30	+30	+30	+30	+30	+30	+30	NR	+30
Burner Nozzle Tilt	Deg. from Hor		-5	-15	-15	-15	0	0	+15	+15	+5	-5
Offset Angle	Deg. from Fuel		33	33	33	33	33	33	33	33	17	17
		OFA 2	100	100	100	100	100	100	100	100	0	100
		OFA 1	100	100	100	100	100	100	100	100	0	100
		AUX 0-1	23	20	16	16	20	30	30	25	45	20
Windbox Compartment	A	COAL 1	100	100	100	100	100	100	100	100	100	100
Damper Position - % Open		AUX 1-2	23	20	16	16	20	30	30	25	45	20
	B	COAL 2	100	100	100	100	100	100	100	100	100	100
		AUX 2-3	23	20	16	16	20	30	30	25	45	20
	C	COAL 3	100	100	100	100	100	100	100	100	100	100
		AUX 3-4	23	20	16	16	20	30	30	25	45	20
	D	COAL 4	100	100	100	100	100	100	100	100	100	100
		OIL 4-5	23	20	16	16	20	30	30	25	45	20
	E	COAL 5	10	100	100	100	100	100	100	100	100	100
		AUX 5-5	50	50	50	50	50	50	50	50	50	50
Flue Gas Oxygen Level	% O_2		3.96	3.69	3.20	3.38	3.38	4.45	4.39	3.59	2.82	2.99
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		264	250	221	233	245	255	215	204	291	201
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		43	62	61	90	115	44	139	151	85	387

NOTES:

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.				311	312	313	314	315	316	317	318	319	320
Date	Year 1982			9/22	9/22	9/22	9/22	9/22	9/22	9/23	9/23	9/23	9/24
Time				12:03	12:47	13:40	15:32	16:05	16:45	11:00	NR	15:52	11:09
Purpose of Test				B Tilts	Aux 5-5 100%	Low Air	OFAT	B Tilts	Low Air	Low Air	Low Air	Aux 5-5	B Tilt OFAT
Unit Load	Gross MW			411	407	408	417	416	416	412	412	422	380
Excess Air	L.N.H			N	N	L	N	N	L	L	L	L	N
Fuel Elevations in Service				All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr			2700	2700	2600	2650	2650	2620	2650	2650	2600	2350
SHO Temperature	Deg. F			980	980	1000	1000	1000	1000	1000	1000	1000	1005
RHO Temperature	Deg. F			987	987	998	998	1016	1018	1008	1008	1008	1003
OFA Nozzle Tilt	Deg. from Hor			+30	+30	+30	0	0	0	0	0	0	+30
Burner Nozzle Tilt	Deg. from Hor			-16	-16	-16	+16	0	0	0	0	0	+20
Offset Angle	Deg. from Fuel			17	17	17	17	17	33	33	33	33	17
Windbox Compartment Damper Position - % Open			OFA 2	100	100	100	100	100	100	100	100	100	100
			OFA 1	100	100	100	100	100	100	100	100	100	100
			AUX 0-1	24	20	16	24	25	20	14	14	21	15
		A	COAL 1	88	88	88	90	90	90	88	88	90	80
			AUX 1-2	24	20	16	24	25	20	14	14	21	15
		B	COAL 2	100	100	100	100	100	100	100	100	100	100
			AUX 2-3	24	20	16	24	25	20	14	14	21	15
		C	COAL 3	100	100	100	100	100	100	100	100	100	100
			AUX 3-4	24	20	16	24	25	20	14	14	21	15
		D	COAL 4	100	100	100	100	100	100	100	100	100	100
			OIL 4-5	24	20	16	24	25	20	14	14	21	15
		E	COAL 5	96	96	96	98	95	95	96	96	99	90
			AUX 5-5	50	100	100	100	100	100	100	100	50	50
Flue Gas Oxygen Level	% O_2			3.68	3.54	2.71	3.60	3.39	2.26	2.41	2.46	2.43	3.60
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)			240	230	197	300	288	258	254	248	248	224
Flue Gas CO Level	PPMV (Adj. to 3% O_2)			193	136	435	106	40	115	56	95	55	153

NOTES:

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.				321	322	323	324	325	326	327	328	329	330
Date	Year 1982			9/24	9/24	9/24	9/24	9/24	9/24	9/24	9/24	9/24	9/27
Time				11:37	11:58	12:38	13:18	14:08	14:29	14:48	15:03	15:53	12:42
Purpose of Test				B Tilt	B Tilt	Lower Air	Offset	B Tilt	B Tilt	Lower Air	Same	Higher Air	Offset
Unit Load	Gross MW			381	377	370	372	369	379	370	374	378	369
Excess Air	L,N,H			N	N	L,N	L,N	L,N	L,N	L	L	H	N
Fuel Elevations in Service				All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr			2350	2450	2400	2340	2300	2500	2300	2300	2450	2400
SHO Temperature	Deg. F			1000	965	978	1000	990	980	1000	1000	985	985
RHO Temperature	Deg. F			985	955	962	1001	993	956	979	981	976	984
OFA Nozzle Tilt	Deg. from Hor			+30	+30	+30	+30	+30	+30	+30	+30	+30	+30
Burner Nozzle Tilt	Deg. from Hor			0	-15	-16	+24	0	-15	-14	-14	-14	-15
Offset Angle	Deg. from Fuel			17	17	17	25	25	25	25	25	25	17
Windbox Compartment Damper Position - % Open			OFA 2	100	100	100	100	100	100	100	100	100	100
			OFA 1	100	100	100	100	100	100	100	100	100	100
			AUX 0-1	12	8	3	10	12	4	0	0	12	0
		A	COAL 1	80	80	78	80	80	80	80	80	80	75
			AUX 1-2	12	8	3	10	12	4	0	0	12	0
		B	COAL 2	100	100	100	100	100	100	100	100	100	100
			AUX 2-3	12	8	3	10	12	4	0	0	12	0
		C	COAL 3	100	100	100	100	100	100	100	100	100	100
			AUX 3-4	12	8	3	10	12	4	0	0	12	0
		D	COAL 4	90	90	90	90	90	90	90	90	90	85
			OIL 4-5	12	8	3	10	12	4	0	0	12	0
		E	COAL 5	90	90	87	86	86	86	86	86	90	85
			AUX 5-5	50	50	50	50	50	50	50	50	50	50
Flue Gas Oxygen Level	% O_2			3.20	3.58	3.40	3.29	3.41	3.52	3.11	3.04	4.66	3.46
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)			206	199	197	242	212	205	180	179	239	202
Flue Gas CO Level	PPMV (Adj. to 3% O_2)			84	64	82	71	104	45	124	84	51	38

NOTES:

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			331	332	333	334	335	336	337	338	339	340
Date	Year 1982		9/27	9/27	9/27	9/27	9/27	9/27	9/28	9/28	9/28	9/28
Time			13:34	14:15	14:36	15:14	15:47	NR	9:33	10:00	10:57	12:37
Purpose of Test			Full Load	High Air	High W.B. Press	Low Air	OFAT	OFAT	OFAT	OFA Closed	Offset 25°	OFA Low Air
Unit Load	Gross MW		427	428	428	430	427	430	422	NR	420	423
Excess Air	L.N.H		N	H	H	H	N.H	N.H	N.H	N.H	N.H	N
Fuel Elevations in Service			All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr		2600	2600	2650	2700	2700	2750	2846	2650	2885	2880
SHO Temperature	Deg. F		1003	990	970	1000	1000	1005	1000	1000	999	1002
RHO Temperature	Deg. F		1003	992	978	1012	1010	1013	1013	1008	1017	1023
OFA Nozzle Tilt	Deg. from Hor		+30	+30	+30	+30	0	-7.5	+15	NA	+15	0
Burner Nozzle Tilt	Deg. from Hor		-15	-15	-15	-15	-15	-15	0	0	0	+15
Offset Angle	Deg. from Fuel		17	17	17	17	17	17	8	8	25	25
Windbox Compartment Damper Position - % Open		OFA 2	100	100	100	100	100	100	100	0	0	100
		OFA 1	100	100	100	100	100	100	100	0	0	100
		AUX 0-1	28	27	17	26	30	30	30	44	46	20
	A	COAL 1	90	90	90	92	90	92	90	90	90	90
		AUX 1-2	28	27	17	26	30	30	30	44	46	20
	B	COAL 2	100	100	100	100	100	100	100	100	100	100
		AUX 2-3	28	27	17	26	30	30	30	44	46	20
	C	COAL 3	100	100	100	100	100	100	100	100	100	100
		AUX 3-4	28	27	17	26	30	30	30	44	46	20
	D	COAL 4	90	90	100	100	100	100	100	100	99	99
		OIL 4-5	28	27	17	26	30	30	30	44	46	20
	E	COAL 5	100	100	100	100	100	100	90	98	98	98
		AUX 5-5	50	50	50	50	50	50	50	50	50	50
Flue Gas Oxygen Level	% O_2		3.47	4.60	4.91	4.08	3.66	3.69	4.39	4.03	4.06	3.56
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		236	302	285	276	268	276	250	340	285	292
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		111	29	25	43	66	48	81	56	56	81

NOTES:

(NA) Not Applicable   (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			341	342	343	344	345	346	347	348	349	350
Date	Year 1982		9/28	9/28	9/28	9/28	9/28	9/29	9/29	9/29	9/29	9/29
Time			13:06	13:34	14:26	15:07	16:17	10:54	14:20	14:49	15:22	16:03
Purpose of Test			Higher Air	B Tilt	Aux 0-1 100%	Aux 0-1 Offset 8°	OFAT Aux 5-5 Offset	Offset B Tilt	OFAT B Tilt	B Tilt	B Tilt	Lower Air
Unit Load	Gross MW		423	417	419	414	419	410	419	417	417	419
Excess Air	L.N.H		H	N	N	N	N	N	N	N	N	L.N
Fuel Elevations in Service			All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr		2867	2856	2911	2881	2877	2893	2868	2863	2859	2867
SHO Temperature	Deg. F		992	1004	1001	998	995	982	999	999	1003	998
RHO Temperature	Deg. F		1022	1030	1001	1010	1016	990	1028	1035	1019	1012
OFA Nozzle Tilt	Deg. from Hor		0	0	0	0	+15	+15	0	0	0	0
Burner Nozzle Tilt	Deg. from Hor		+15	0	0	0	0	-15	0	+10	-10	-10
Offset Angle	Deg. from Fuel		25	25	25	25,8	25,8	17,8	17,8	17,8	17,8	17,8
Windbox Compartment Damper Position - % Open		OFA 2	100	100	100	100	100	100	100	100	100	100
		OFA 1	100	100	100	100	100	100	100	100	100	100
		AUX 0-1	24	24	100	100	100	100	100	100	100	100
	A	COAL 1	90	90	90	90	90	80	90	94	94	92
		AUX 1-2	24	24	12	14	20	14	24	22	20	14
	B	COAL 2	100	100	100	100	100	100	100	100	100	100
		AUX 2-3	24	24	12	14	20	14	24	22	20	14
	C	COAL 3	100	100	100	100	100	100	100	100	100	100
		AUX 3-4	24	24	12	14	20	14	24	22	20	14
	D	COAL 4	100	100	100	100	100	100	100	100	100	100
		OIL 4-5	24	24	12	14	20	14	24	22	20	14
	E	COAL 5	95	96	96	96	96	100	100	100	100	100
		AUX 5-5	50	50	50	50	50	50	50	50	50	50
Flue Gas Oxygen Level	% O_2		3.19	3.12	2.75	2.92	3.37	3.21	3.91	3.87	3.82	3.13
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		280	265	229	244	227	204	262	265	249	232
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		100	58	150	73	183	190	65	144	62	68
NOTES:						(8)	(9)	(8)	(8)	(8)	(8)	(8)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.		351	352	353	354	355	356	357	358	359	360
Date	Year 1982	9/30	9/30	9/30	9/30	9/30	9/30	9/30	9/30	9/30	9/30
Time		10:25	11:30	12:07	13:14	14:03	14:39	15:24	16:12	16:50	19:54
Purpose of Test		As Found	Aux 0-1 Open	Aux 0-1 Normal	Load OFA	Load OFA	Load OFA	Load OFA	Load Fuel Elev	Load OFA	Load
Unit Load	Gross MW	428	428	404	387	369	360	337	321	296	370
Excess Air	L,N,H	N	N	N,H	N,H	N,H	N,H	N,H	N,H	N	N
Fuel Elevations in Service		All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr	2750	2750	2750	2450	2300	2200	2283	2166	2001	2537
SHO Temperature	Deg. F	1010	1000	1000	1000	1000	998	1002	1003	1018	999
RHO Temperature	Deg. F	1020	1014	1003	1005	1003	1007	1009	1014	1006	1004
OFA Nozzle Tilt	Deg. from Hor	0	0	0	0	0	0	0	0	0	0
Burner Nozzle Tilt	Deg. from Hor	+18	-5	-3	+22	+20	+18	+12	-5	-7	-10
Offset Angle	Deg. from Fuel	17,8	17,8	17,8	17,8	17,8	17,8	17,8	17,8	17,8	17,8
Windbox Compartment Damper Position - % Open	OFA 2	100	100	100	100	62	53	48	30	0	0
	OFA 1	100	100	100	100	62	53	48	30	0	0
	AUX 0-1	32	100	20	10	10	11	14	14	35	32
	A COAL 1	95	95	95	85	78	74	66	92	75	80
	AUX 1-2	32	20	20	10	10	11	14	14	35	32
	B COAL 2	100	100	100	100	100	100	100	100	100	100
	AUX 2-3	32	20	20	10	10	11	14	14	35	32
	C COAL 3	100	100	100	100	100	100	100	100	100	100
	AUX 3-4	32	20	20	10	10	11	14	14	35	32
	D COAL 4	100	100	100	95	90	84	80	100	100	90
	OIL 4-5	32	20	20	10	10	11	14	14	35	32
	E COAL 5	100	100	100	95	87	84	80	25	25	90
	AUX 5-5	50	50	50	50	50	50	50	50	50	50
Flue Gas Oxygen Level	% O_2	4.40	3.20	4.11	3.40	3.32	3.14	3.34	3.58	4.51	4.32
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)	306	233	250	303	269	250	254	255	364	369
Flue Gas CO Level	PPMV (Adj. to 3% O_2)	75	118	61	177	87	474	464	689	54	57
NOTES:		(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.		361	362	363	364	365	366	367	368	369	370
Date	Year 1982	9/30	9/30	9/30	9/30	9/30	10/1	10/1	10/1	10/1	10/5
Time		20:27	21:59	22:26	23:30	23:57	0:20	11:45	12:15	12:44	10:30
Purpose of Test		B Tilts	Load B Tilts	Lower Air	Load	Low Air	OFA	OFA	OFA	Load	Rec. Oper.
Unit Load	Gross MW	371	299	296	203	203	203	377	355	331	424
Excess Air	L.N.H	N	N	L.N	N	L.N	L.N	N	N	N	L.N
Fuel Elevations in Service		All 5	ABCD	ABCD	BCD	BCD	BCD	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr	2568	2017	2023	1410	1410	1402	NR	NR	NR	2910
SHO Temperature	Deg. F	1003	1005	1001	1001	1003	1008	NR	NR	NR	1004
RHO Temperature	Deg. F	992	992	1003	961	969	977	NR	NR	NR	NR
OFA Nozzle Tilt	Deg. from Hor	0	0	0	0	0	0	0	0	0	+12
Burner Nozzle Tilt	Deg. from Hor	+17	+24	+24	+30	+20	0	0	+4	+8	+10
Offset Angle	Deg. from Fuel	17,8	17,8	17,8	17,8	17,8	17,8	17,8	17,8	17,8	8
Windbox Compartment Damper Position - % Open	OFA 2	0	0	0	0	0	58	100	100	100	100
	OFA 1	0	0	0	0	0	58	100	100	100	100
	AUX 0-1	38	35	31	0	0	0	18	0	0	34
	A COAL 1	78	75	75	16	17	16	90	90	NR	96
	AUX 1-2	38	35	31	43	20	11	18	0	0	34
	B COAL 2	100	100	100	100	100	100	90	90	NR	96
	AUX 2-3	38	35	31	43	20	11	18	0	0	34
	C COAL 3	100	100	100	100	100	100	90	90	NR	96
	AUX 3-4	38	35	31	43	20	11	18	0	0	34
	D COAL 4	90	90	85	80	82	83	90	90	NR	96
	OIL 4-5	38	35	31	43	20	11	18	0	0	34
	E COAL 5	88	25	25	25	25	25	90	90	NR	96
	AUX 5-5	50	50	50	50	50	50	50	50	50	50
Flue Gas Oxygen Level	% O_2	5.25	4.50	3.71	4.11	4.85	4.90	4.34	3.88	3.88	3.68
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)	334	294	281	293	278	227	278	267	270	210
Flue Gas CO Level	PPMV (Adj. to 3% O_2)	63	65	110	65	62	63	53	67	82	674
NOTES:		(8)	(8)	(8)	(8)	(8)	(8)	(8)(9)	(8)(9)	(8)(9)	(9)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.				371	372	373	374	375	376	377	378	379	380
Date	Year 1982			10/5	10/5	10/5	10/5	10/5	10/5	10/5	10/5	10/8	10/8
Time				11:31	11:47	12:24	12:53	13:24	13:54	14:24	NR	NR	NR
Purpose of Test				Load	OFA	Load Low Air	Load	Load	OFAT	Same	Gas Tap	Gas Tap	Gas Tap
Unit Load	Gross MW			382	384	350	322	353	355	349	335	320	314
Excess Air	L,N,H			L,N	L,N	L,N	N	L,N	L,N	L,N	NR	NR	NR
Fuel Elevations in Service				All 5	ABCD	ABCD	BCD	BCD	BCD	All 5	All 5	ABCD	ABCD
Main Steam Flow	x 10E3 Lb/Hr			2599	2622	2386	2189	2393	2407	2361	NR	NR	NR
SHO Temperature	Deg. F			1000	986	999	1001	1006	1007	1006	NR	NR	NR
RHO Temperature	Deg. F			NR	NR	NR	NR	1007	1006	1006	NR	NR	NR
OFA Nozzle Tilt	Deg. from Hor			0	0	0	0	0	+10	+10	0	0	0
Burner Nozzle Tilt	Deg. from Hor			+10	+10	+13	+20	+20	+10	+10	+10	+10	+20
Offset Angle	Deg. from Fuel			8	8	8	8	8	8	8	8	8	8
Windbox Compartment Damper Position - % Open			OFA 2	0	100	100	100	100	100	100	0	0	0
			OFA 1	0	100	100	100	100	100	100	0	0	0
			AUX 0-1	34	16	6	0	0	0	3	30	30	35
		A	COAL 1	78	85	69	62	79	73	75	90	90	90
			AUX 1-2	34	16	6	0	0	0	3	30	30	35
		B	COAL 2	100	100	100	100	100	100	100	90	90	90
			AUX 2-3	34	16	6	0	0	0	3	30	30	35
		C	COAL 3	100	100	100	97	100	100	100	90	90	90
			AUX 3-4	34	16	6	0	0	0	3	30	30	35
		D	COAL 4	90	95	81	75	91	86	86	90	90	90
			OIL 4-5	34	16	6	0	0	0	3	30	30	35
		E	COAL 5	77	95	80	72	88	84	84	25	25	25
			AUX 5-5	50	50	50	50	50	50	50	50	50	50
Flue Gas Oxygen Level	% O_2			4.05	4.35	3.93	4.02	3.72	3.68	3.68	3.88	4.49	4.40
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)			298	283	280	288	279	244	233	288	327	290
Flue Gas CO Level	PPMV (Adj. to 3% O_2)			222	70	70	78	73	72	71	120	102	95
NOTES:				(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.		381	382	383	384	385	386	387	388	389	390
Date	Year 1982	10/8	10/8	10/12	10/12	10/12	10/12	10/12	10/13	10/13	10/13
Time		NR	NR	NR	NR	NR	NR	NR	10:40	11:15	11:40
Purpose of Test		Gas Tap	Gas Tap	Gas Tap	Gas Tap	Gas Tap	Gas Tap	Gas Tap	SASS TEST	SASS	SASS
Unit Load	Gross MW	313	315	322	335	330	375	375	375	375	375
Excess Air	L,N,H	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Fuel Elevations in Service		ABCD	ABCD	ABCD	ABCD	ABCD	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr	NR	NR	NR	NR	NR	NR	NR	2588	2586	2587
SHO Temperature	Deg. F	NR	NR	NR	NR	NR	NR	NR	997	999	1002
RHO Temperature	Deg. F	NR	NR	NR	NR	NR	NR	NR	1008	1016	1012
OFA Nozzle Tilt	Deg. from Hor	0	0	+10	0	+10	+10	+10	+10	+10	+10
Burner Nozzle Tilt	Deg. from Hor	+5	+20	+5	+7	+7	+18	+12	+20	+11	+6
Offset Angle	Deg. from Fuel	8	8	8	8	8	8	8	8	8	8
Windbox Compartment Damper Position - % Open	OFA 2	0	0	100	100	100	100	100	100	100	100
	OFA 1	0	0	100	100	100	100	100	100	100	100
	AUX 0-1	35	33	12	10	0	5	5	0	10	10
	A COAL 1	90	90	90	90	90	90	90	90	90	90
	AUX 1-2	35	33	12	10	0	5	5	0	10	10
	B COAL 2	90	90	90	90	90	90	90	90	90	90
	AUX 2-3	35	33	12	10	0	5	5	0	10	10
	C COAL 3	90	90	90	90	90	90	90	90	90	90
	AUX 3-4	35	33	12	10	0	5	5	0	10	10
	D COAL 4	90	90	90	90	90	90	90	90	90	90
	OIL 4-5	35	33	12	10	0	5	5	0	10	10
	E COAL 5	25	25	25	25	25	90	90	90	90	90
	AUX 5-5	50	50	50	50	50	50	50	50	50	50
Flue Gas Oxygen Level	% O_2	4.64	4.58	4.31	4.01	3.85	3.61	3.52	3.72	3.60	3.46
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)	327	298	229	251	222	245	224	251	236	211
Flue Gas CO Level	PPMV (Adj. to 3% O_2)	59	70	68	50	51	65	55	60	62	56
NOTES:		(9)	(9)	(9)	(9)	(9)	(9)	(9)			

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.				391	392	393	394	395	396	397	398	399	400
Date	Year 1982			10/13	10/10	10/13	10/14	10/14	10/14	10/14	10/14	10/14	10/15
Time				12:13	12:43	15:46	NR	NR	NR	NR	NR	NR	NR
Purpose of Test				SASS	SASS	SASS	Gas Tap	Gas Tap	Gas Tap	Gas Tap	Gas Tap	Gas Tap	Gas Tap
Unit Load	Gross MW			375	375	371	351	350	352	350	350	352	354
Excess Air	L.N.H			NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Fuel Elevations in Service				All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr			2592	2590	2593	NR	NR	NR	NR	NR	NR	NR
SHO Temperature	Deg. F			1000	1003	999	NR	NR	NR	NR	NR	NR	NR
RHO Temperature	Deg. F			1010	1006	993	NR	NR	NR	NR	NR	NR	NR
OFA Nozzle Tilt	Deg. from Hor			+10	+10	+10	+10	+10	+10	+10	+10	+10	+10
Burner Nozzle Tilt	Deg. from Hor			0	-5	+17	+24	+23	+20	+20	+18	+10	+27
Offset Angle	Deg. from Fuel			8	8	8	8	8	8	8	8	8	8
			OFA 2	100	100	100	100	100	100	100	100	100	100
			OFA 1	100	100	100	100	100	100	100	100	100	100
			AUX 0-1	8	5	6	0	0	0	0	0	0	0
Windbox Compartment		A	COAL 1	90	90	95	90	90	90	90	90	90	90
Damper Position - % Open			AUX 1-2	8	5	6	0	0	0	0	0	0	0
		B	COAL 2	90	90	90	90	90	90	90	90	90	90
			AUX 2-3	8	5	6	0	0	0	0	0	0	0
		C	COAL 3	90	90	90	90	90	90	90	90	90	90
			AUX 3-4	8	5	6	0	0	0	0	0	0	0
		D	COAL 4	90	90	90	90	90	90	90	90	90	90
			OIL 4-5	8	5	6	0	0	0	0	0	0	0
		E	COAL 5	90	90	90	90	90	90	90	90	90	90
			AUX 5-5	50	50	50	50	50	50	50	50	50	50
Flue Gas Oxygen Level	% O_2			3.40	3.49	3.64	3.84	3.72	3.45	3.31	3.24	3.68	3.88
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)			200	192	241	279	280	264	253	252	247	286
Flue Gas CO Level	PPMV (Adj. to 3% O_2)			57	60	54	46	55	53	56	53	56	68
NOTES:							(9)	(9)	(9)	(9)	(9)	(9)	(9)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.				401	402	403	404	405
Date	Year 1982			10/15	10/15	10/15	10/15	10/15
Time				NR	14:16	NR	15:10	NR
Purpose of Test				SASS	SASS	SASS	SASS	SASS
Unit Load	Gross MW			350	354	350	353	356
Excess Air	L.N.H			NR	NR	NR	NR	NR
Fuel Elevations in Service				All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr			NR	2416	NR	2414	NR
SHO Temperature	Deg. F			NR	998	NR	997	NR
RHO Temperature	Deg. F			NR	1007	NR	1007	NR
OFA Nozzle Tilt	Deg. from Hor			+10	+10	+10	+10	+10
Burner Nozzle Tilt	Deg. from Hor			+23	+18	+18	+17	+17
Offset Angle	Deg. from Fuel			8	8	8	8	8
Windbox Compartment Damper Position - % Open			OFA 2	100	100	100	100	100
			OFA 1	100	100	100	100	100
			AUX 0-1	0	0	0	0	0
		A	COAL 1	90	90	90	90	90
			AUX 1-2	0	0	0	0	0
		B	COAL 2	90	90	90	90	90
			AUX 2-3	0	0	0	0	0
		C	COAL 3	90	90	90	90	90
			AUX 3-4	0	0	0	0	0
		D	COAL 4	90	90	90	90	90
			OIL 4-5	0	0	0	0	0
		E	COAL 5	90	90	90	90	90
			AUX 5-5	50	50	50	50	50
Flue Gas Oxygen Level	% O_2			3.78	3.38	3.42	3.32	3.01
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)			282	257	261	252	243
Flue Gas CO Level	PPMV (Adj. to 3% O_2)			58	60	60	60	57
NOTES:				(9)		(9)		(9)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			501	502	503	504	505	506	507	508	509	510
Date	Year 1983		3/17	3/17	3/17	3/18	3/18	3/18	3/18	3/18	3/21	3/21
Time			NR	NR	NR	10:26	12:34	13:26	14:34	15:18	NR	14:03
Unit Load	Gross MW		280	285	285	320	320	320	321	320	310	310
Excess Air	L,N,H		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Fuel Elevations in Service			ABDE	ABCD	ABCD	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr		NR	NR	NR	2219	2217	2215	2209	2214	NR	2257
SHO Temperature	Deg. F		NR	NR	NR	996	995	996	1000	997	NR	998
RHO Temperature	Deg. F		NR	NR	NR	1010	1012	1011	1012	1008	NR	1014
OFA Nozzle Tilt	Deg. from Hor		+10	+10	+10	+10	+10	+10	+10	+10	+10	+10
Burner Nozzle Tilt	Deg. from Hor		+10	+15	+15	+20	+17	+16	+15	+18	+19	+18
Offset Angle	Deg. from Fuel		8	8	8	8	8	8	8	8	8	8
Windbox Compartment Damper Position - % Open		OFA 2	50	100	100	100	100	100	100	100	100	100
		OFA 1	50	100	100	100	100	100	100	100	100	100
		AUX 0-1	NR	NR	NR	0	0	0	0	0	0	0
	A	COAL 1	100	100	100	100	100	100	100	100	100	100
		AUX 1-2	NR	NR	NR	0	0	0	0	0	0	0
	B	COAL 2	100	100	100	100	100	100	100	100	100	100
		AUX 2-3	NR	NR	NR	0	0	0	0	0	0	0
	C	COAL 3	25	100	100	100	100	100	100	100	100	100
		AUX 3-4	NR	NR	NR	0	0	0	0	0	0	0
	D	COAL 4	100	100	100	100	100	100	100	100	100	100
		OIL 4-5	NR	NR	NR	0	0	0	0	0	0	0
	E	COAL 5	100	25	25	100	100	100	100	100	100	100
		AUX 5-5	50	50	50	50	50	50	50	50	50	50
Flue Gas Oxygen Level	% O_2		3.79	3.91	3.02	3.05	3.02	3.07	3.05	3.12	3.09	3.26
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		209	264	237	247	241	241	239	254	244	219
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		26	22	33	19	21	24	27	21	22	45
NOTES:			(9)(10)	(9)(10)	(9)(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			511	512	513	514	515	516	517	518	519	520
Date	Year 1983		3/21	3/21	3/21	3/21	3/21	3/21	3/21	3/22	3/22	3/22
Time			NR	14:45	15:12	15:30	16:12	16:27	16:50	10:29	11:44	13:32
Unit Load	Gross MW		327	325	327	326	326	326	325	430	434	430
Excess Air	L,M,H		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Fuel Elevations in Service			All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5	All 5
Main Steam Flow	x 10E3 Lb/Hr		2257	2268	2259	2272	2267	2273	2279	2230	2933	2946
SHO Temperature	Deg. F		998	998	997	1005	1000	998	1002	993	998	995
RHO Temperature	Deg. F		1014	1011	1011	1015	1014	1014	1011	1013	1021	1009
OFA Nozzle Tilt	Deg. from Hor		+10	+10	+10	+10	+10	+10	+10	+10	+10	+10
Burner Nozzle Tilt	Deg. from Hor		+17	+16	+14	+13	+12	+10	+9	+23	+22	+22
Offset Angle	Deg. from Fuel		8	8	8	8	8	8	8	8	8	8
Windbox Compartment Damper Position - % Open		OFA 2	100	100	100	100	0	0	100	100	100	100
		OFA 1	50	100	100	100	0	0	100	100	100	100
		AUX 0-1	0	0	0	0	18	6	0	12	12	14
	A	COAL 1	100	100	100	100	100	100	100	100	100	100
		AUX 1-2	0	0	0	0	18	6	0	12	12	14
	B	COAL 2	100	100	100	100	100	100	100	100	100	100
		AUX 2-3	0	0	0	0	18	6	0	12	12	14
	C	COAL 3	100	100	100	100	100	100	100	100	100	100
		AUX 3-4	0	0	0	0	18	6	0	12	12	14
	D	COAL 4	100	100	100	100	100	100	100	100	100	100
		OIL 4-5	0	0	0	0	18	6	0	12	12	14
	E	COAL 5	100	100	100	100	100	100	100	100	100	100
		AUX 5-5	50	50	50	0	100	40	40	40	40	40
Flue Gas Oxygen Level	% O_2		3.17	2.88	3.28	3.61	5.23	5.09	4.00	3.43	3.47	3.77
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		217	199	232	248	357	379	245	281	284	280
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		56	404	44	28	31	31	24	34	27	29
NOTES:			(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			521	522	523	524	525	526	527	528	529	530
Date	Year 1983		3/22	3/23	3/23	3/23	3/23	3/23	3/23	3/23	3/23	3/24
Time			15:12	9:39	10:14	10:27	11:20	12:05	12:34	12:55	13:13	0:51
Unit Load	Gross MW		435	318	318	318	323	322	323	324	322	187
Excess Air	L.N.H		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Fuel Elevations in Service			All 5	ABCD	ABCD	ABCD	ABCD	ABCD	ABCD	ABCD	ABCD	ABCD
Main Steam Flow	x 10E3 Lb/Hr		2932	2216	2218	2243	2214	2236	2251	2243	2242	1384
SHO Temperature	Deg. F		1003	1002	1000	995	1005	998	998	1000	996	990
RHO Temperature	Deg. F		1002	1009	1006	1005	1014	1009	1004	1006	1001	970
OFA Nozzle Tilt	Deg. from Hor		+10	0	0	0	+10	+10	+10	0	0	0
Burner Nozzle Tilt	Deg. from Hor		+22	+15	+19	+10	+23	+18	+13	+15	+20	+25
Offset Angle	Deg. from Fuel		8	8	8	8	8	8	8	8	8	8
Windbox Compartment Damper Position - % Open		OFA 2	100	70	70	70	70	70	70	0	0	0
		OFA 1	100	70	70	70	70	70	70	0	0	0
		AUX 0-1	13	5	5	2	2	2	8	24	20	10
	A	COAL 1	100	100	100	100	100	100	100	100	100	25
		AUX 1-2	13	5	5	2	2	2	8	24	20	10
	B	COAL 2	100	100	100	100	100	100	100	100	100	100
		AUX 2-3	13	5	5	2	2	2	8	24	20	10
	C	COAL 3	100	100	100	100	100	100	100	100	100	100
		AUX 3-4	13	5	5	2	2	2	8	24	20	10
	D	COAL 4	100	100	100	100	100	100	100	100	100	100
		OIL 4-5	13	5	5	2	2	2	8	24	20	10
	E	COAL 5	100	25	25	25	25	25	25	25	25	25
		AUX 5-5	40	40	40	40	40	40	40	40	40	40
Flue Gas Oxygen Level	% O_2		3.60	4.15	4.26	3.76	4.12	3.61	4.74	5.38	4.96	6.34
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		274	300	321	278	284	275	277	345	329	308
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		25	26	58	28	135	32	17	48	33	26
NOTES:			(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			531	532	533	534	535	536	537	538	539	540
Date	Year 1983		3/24	3/24	3/24	3/25	3/28	3/28	3/28	3/28	3/28	3/28
Time			1:25	3:06	3:30	NR	NR	NR	NR	NR	NR	NR
Unit Load	Gross MW		186	191	190	273	321	317	314	314	310	313
Excess Air	L.N.H		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Fuel Elevations in Service			BCD	BCD	BCD	ABCD	ABCD	ABCD	All 5	All 5	BCDE	BCDE
Main Steam Flow	x 10E3 Lb/Hr		1382	1384	1386	NR	NR	NR	NR	NR	NR	NR
SHO Temperature	Deg. F		989	992	993	NR	NR	NR	NR	NR	NR	NR
RHO Temperature	Deg. F		969	972	973	NR	NR	NR	NR	NR	NR	NR
OFA Nozzle Tilt	Deg. from Hor		+10	0	0	0	+10	+10	+10	+10	+10	+10
Burner Nozzle Tilt	Deg. from Hor		+26	+26	+26	+24	+25	+23	+24	+23	+23	+22
Offset Angle	Deg. from Fuel		8	8	8	8	8	8	8	8	8	8
		OFA 2	0	0	0	0	100	50	50	100	100	100
		OFA 1	0	0	0	0	100	50	50	100	100	100
		AUX 0-1	10	10	10	12	0	0	0	0	0	0
Windbox Compartment	A	COAL 1	100	100	100	100	100	100	100	100	18	18
Damper Position - % Open		AUX 1-2	10	10	10	12	0	0	0	0	0	0
	B	COAL 2	100	100	100	100	100	100	100	100	100	100
		AUX 2-3	10	10	10	12	0	0	0	0	0	0
	C	COAL 3	100	100	100	100	100	100	100	100	100	100
		AUX 3-4	10	10	10	12	0	0	0	0	0	0
	D	COAL 4	100	100	100	100	100	100	100	100	100	100
		OIL 4-5	10	10	10	12	0	0	0	0	0	0
	E	COAL 5	100	100	100	100	100	100	40	40	100	100
		AUX 5-5	40	40	40	40	40	40	40	40	40	40
Flue Gas Oxygen Level	% O_2		6.34	5.68	5.79	4.53	3.76	3.55	3.11	3.39	3.06	2.84
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		308	272	276	344	305	287	251	265	212	198
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		26	27	26	31	36	27	31	22	55	169
NOTES:			(10)	(10)	(10)	(9)(10)	(9)(10)	(9)(10)	(9)(10)	(9)(10)	(9)(10)	(9)(10)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.				541	542	543	544	545
Date	Year 1983			3/28	3/29	3/29	3/29	3/29
Time				NR	NR	NR	NR	NR
Unit Load	Gross MW			314	325	320	321	320
Excess Air	L.N.H			NR	NR	NR	NR	NR
Fuel Elevations in Service				BCDE	All 5	ABCD	ABCD	ABCD
Main Steam Flow	x 10E3 Lb/Hr			NR	NR	NR	NR	NR
SHO Temperature	Deg. F			NR	NR	NR	NR	NR
RHO Temperature	Deg. F			NR	NR	NR	NR	NR
OFA Nozzle Tilt	Deg. from Hor			+10	+10	+10	+10	+10
Burner Nozzle Tilt	Deg. from Hor			+22	+23	+23	+23	+23
Offset Angle	Deg. from Fuel			8	8	8	8	8
			OFA 2	50	50	50	50	50
			OFA 1	50	50	50	50	50
			AUX 0-1	0	1	5	3	2
Windbox Compartment		A	COAL 1	18	80	80	80	80
Damper Position - % Open			AUX 1-2	0	1	5	3	2
		B	COAL 2	100	80	80	80	80
			AUX 2-3	0	1	5	3	2
		C	COAL 3	100	80	80	80	80
			AUX 3-4	0	1	5	3	2
		D	COAL 4	100	80	80	80	80
			OIL 4-5	0	1	5	3	2
		E	COAL 5	100	80	32	32	32
			AUX 5-5	40	40	40	40	40
Flue Gas Oxygen Level	% O_2			2.77	3.23	3.87	3.45	3.67
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)			195	264	275	264	263
Flue Gas CO Level	PPMV (Adj. to 3% O_2)			781	50	37	65	124
NOTES:				(9),(10)	(9),(10)	(9),(10)	(9),(10)	(9),(10)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.			601	602	603	604	605	606	607	608	609	610
Date	Year 1984		3/12	3/12	3/12	3/13	3/13	3/13	3/13	3/13	3/13	3/13
Time			9:40	10:45	11:28	9:30	10:05	10:50	12:30	13:10	13:30	14:30
Purpose of Test			As Found OFA	Burner Tilt OFA	Lower Air OFA	B Tilts No OFA	B Tilts No OFA	Repeat 603	OFAT B Tilt	OFAT B Tilt	OFAT B Tilt	As Found
Unit Load	Gross MW		328	323	321	298	313	316	314	323	NR	NR
Excess Air	L,N,H		N	N	L	N	N	N	N	N	N	N
Fuel Elevations in Service			ABCD	ABCD	ABCD	ABCD	ABCD	ABCD	ABCD	ABCD	ABCD	ABCD
Main Steam Flow	x 10E3 Lb/Hr		2242	2165	2214	2033	2147	2154	2166	BD	BD	2029
SHO Temperature	Deg. F		1005	1003	1003	1004	1006	1006	1002	1008	977	1009
RHO Temperature	Deg. F		1002	986	NR	1007	993	983	NR	986	961	1007
OFA Nozzle Tilt	Deg. from Hor		+3	+3	+3	+3	+3	+3	+15	+15	+15	+15
Burner Nozzle Tilt	Deg. from Hor		+6	-10	0	+25	0	0	+10	-10	-15	+12
Offset Angle	Deg. from Fuel		8	8	8	8	8	8	8	8	8	8
Windbox Compartment Damper Position - % Open		OFA 2	100	100	100	0	0	100	100	100	100	100
		OFA 1	100	100	100	0	0	100	100	100	100	100
		AUX 0-1	0	0	0	22	26	0	0	0	0	0
	A	COAL 1	100	100	100	100	100	100	100	100	100	100
		AUX 1-2	0	0	0	22	26	0	0	0	0	0
	B	COAL 2	100	100	100	100	100	100	100	100	100	100
		AUX 2-3	0	0	0	22	26	0	0	0	0	0
	C	COAL 3	100	100	100	100	100	100	100	100	100	100
		AUX 3-4	0	0	0	22	26	0	0	0	0	0
	D	COAL 4	100	100	100	100	100	100	100	100	100	100
		OIL 4-5	0	0	0	22	26	0	0	0	0	0
	E	COAL 5	0	0	0	0	0	0	0	0	0	0
		AUX 5-5	25	25	25	25	25	25	25	25	25	25
Flue Gas Oxygen Level	% O_2		3.32	3.78	3.40	3.61	3.79	4.05	3.77	3.13	3.94	3.51
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)		263	259	258	315	319	275	247	206	226	277
Flue Gas CO Level	PPMV (Adj. to 3% O_2)		24	19	39	660	23	25	33	45	24	28

NOTES:

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

OPERATING AND EMISSIONS DATA SUMMARY
UP&L HUNTER NO. 2

TEST NO.		611	612	613	614	615	616	617	618	619	620
Date	Year 1984	3/13	3/14	3/14	3/14	3/14	3/19	3/19	3/19	3/19	3/19
Time		15:30	9:40	10:10	10:45	11:30	NR	NR	NR	NR	NR
Purpose of Test		OFA 100%	OFA 36%	OFA 60%	OFA 60%	OFA 60%	Emiss. Only	Emiss. Only	Emiss. Only	Emiss. Only	Emiss. Only
Unit Load	Gross MW	300	312	323	299	271	312	310	270	270	261
Excess Air	L.N.H	N	N	N	N	N	N	N	N	N	N
Fuel Elevations in Service		ABCD	ABCD	ABCD	ABCD	ABCE	ABCD	ABCD	ABCD	ABCD	ABCD
Main Steam Flow	x 10E3 Lb/Hr	2149	2145	2231	1925	1887	NR	NR	NR	NR	NR
SHO Temperature	Deg. F	1006	1008	1003	1008	1012	NR	NR	NR	NR	NR
RHO Temperature	Deg. F	1007	1010	1011	1008	989	NR	NR	NR	NR	NR
OFA Nozzle Tilt	Deg. from Hor	+5	+5	+5	+5	+5	+5	+5	+5	+5	+5
Burner Nozzle Tilt	Deg. from Hor	+10	+20	+17	+17	+23	+25	0	0	+16	+25
Offset Angle	Deg. from Fuel	8	8	8	8	8	8	8	8	8	8
	OFA 2	100	36	60	60	60	0	0	0	0	0
	OFA 1	100	36	60	60	60	0	0	0	0	0
	AUX 0-1	4	16	0	0	0	20	22	23	16	19
Windbox Compartment	A COAL 1	100	100	100	100	80	100	100	NR	100	100
Damper Position - % Open	AUX 1-2	4	16	0	0	0	20	22	23	16	19
	B COAL 2	100	100	100	100	100	100	100	NR	100	100
	AUX 2-3	4	16	0	0	0	20	22	23	16	19
	C COAL 3	100	100	100	100	50	100	100	NR	100	100
	AUX 3-4	4	16	0	0	0	20	22	23	16	19
	D COAL 4	100	100	100	100	90	NR	100	NR	100	100
	OIL 4-5	4	16	0	0	0	20	22	23	16	19
	E COAL 5	0	0	0	0	100	100	NR	NR	NR	NR
	AUX 5-5	25	25	25	25	25	25	25	25	25	25
Flue Gas Oxygen Level	% O_2	4.19	4.26	3.59	3.42	4.22	4.33	4.25	4.80	4.22	4.59
Flue Gas NOx Level	PPMV (Adj. to 3% O_2)	287	314	308	286	298	324	338	358	354	361
Flue Gas CO Level	PPMV (Adj. to 3% O_2)	26	381	27	19	20	37	20	17	27	25
NOTES:							(9)	(9)	(9)	(9)	(9)

(NA) Not Applicable (BD) Bad Data
(NR) Not Recorded

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		1	2	3	4	5	6	7	8
Date	1981	8/3	8/3	8/3	8/3	8/4	8/4	8/4	8/4
FLOWS, 10E3 LB/HR									
Air Flow		3284	3258	2964	3754	3303	3339	3282	3278
Feedwater		2877	3003	2950	2994	2981	2981	3036	2986
Main Steam		2774	2872	2832	2843	2792	2836	2854	2850
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		0	0	0	0	0	0	0	0
Stm. AH Extr.		7.0	0	0	0	0	0	0	0
Stm. AH Aux.		0	0	0	0	0	0	0	0
Condensate Flow		2186	2244	2267	2333	2311	2228	2352	2255
Superheat Spray L		28.9	0	0	17.68	0	0	0	0
Superheat Spray R		0	0	0	0	0	0	0	0
Reheat Spray		0	0	0	35.43	0	0	0	0
PRESSURES Steam & Water, Psig									
Boiler Drum		2658	2682	2661	2669	2632	2669	2663	2662
Throttle Steam		2403	2416	2395	2403	2372	2400	2395	2395
Turbine 1st Stage		1713	1771	1755	1761	1705	1759	1755	1755
Turbine Cold Reheat		546	594	559	565	543	556	558	557
Reheat Inlet		506	522	517	523	503	515	516	515
Extr. Steam (HP-FW)		538	554	549	556	534	547	548	547
Main Steam		2418	2427	2407	2415	2382	2411	2405	2402
Aux. Steam		346	345	347	345	343	342	343	344
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		10.5	10	8	12	11	10	10.5	9.5
FD Fan 2-2 Discharge		12	12	10	14	13	12	12.5	11.5
AH 2-1 Air Diff.		2.73	2.73	2.33	3.47	2.72	2.66	2.7	2.68
AH 2-2 Air Diff.		3.7	3.56	3.12	4.53	3.62	3.67	3.6	3.56
Windbox Pressure L		4.2	4	3.5	4.5	4.2	4.2	4.5	4.
Windbox Pressure R		4.5	4	3.5	4.8	4.2	4.2	4.7	4.
WB/Furn. Diff. L		5	5	4	5	5.5	5.2	5.2	4.5
WB/Furn. Diff. R		5	5	4	5.5	5.5	5.2	5.2	4.5
Furnace Draft		-0.96	-.048	-0.32	-0.32	-0.58	-0.50	-0.95	-0.58
SH Draft Diff.		1.99	1.93	1.65	2.53	2.12	2.02	1.99	1.98
Econ. Draft Diff.		2.9	2.31	2.37	NR	3.00	2.89	2.9	2.88
AH 2-1 Gas Diff.		15	11	9.5	13.5	12.5	11.5	12	11.5
AH 2-2 Gas Diff.		13	12.5	11	5	13.0	12	12.5	12
ID Fan 2-1 Inlet		-14.3	-13.4	-11.4	-16.8	-14.62	-14.5	-15	-14.9
ID Fan 2-2 Inlet		-16.1	-14.9	-12.96	-18.0	-15.1	-14.9	-15	-15.0
Atm. Barometric "Hg		24.45	24.42	24.40	24.38	24.45	24.44	24.44	24.43

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		9	10	11	12	13	14	15	16
Date	1981	8/5	8/5	8/5	8/5	8/5	8/6	8/6	8/6
FLOWS, 10E3 LB/HR									
Air Flow		3474	3382	3275	3277	3188	3365	3292	3264
Feedwater		2885	2943	2913	2899	2886	2916	2850	2886
Main Steam		2804	2824	2799	2801	2792	2759	2760	2753
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		0	0	0	0	0	0	0	0
Stm. AH Extr.		0	0	0	0	0	6.4	0	0
Stm. AH Aux.		0	0	0	0	0	0	0	0
Condensate Flow		2262	2286	2238	2246	2259	2272	2210	2198
Superheat Spray L		37.5	0	17.97	33.98	42.	17.	0	0
Superheat Spray R		0	0	0	0	17.	0	0	0
Reheat Spray		0	0	0	0	0	0	0	0
PRESSURES									
Steam & Water, Psig									
Boiler Drum		2670	2670	2660	2659	2665	2658	2653	2657
Throttle Steam		2414	2413	2399.55	2400	2408	2406	2402	2403
Turbine 1st Stage		1743	1742	1734	1734	1739	1712	1708	1711
Turbine Cold Reheat		555	553	551	553	554	544	543	544
Reheat Inlet		514	512	510	512	513	504	503	503
Extr. Steam (HP-FW)		547	544	542	544	546	536	535	532
Main Steam		2426	2422	2409	2410	2418	2415	2411	2414
Aux. Steam		339	339	341	344	343	339	342	339
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		10.5	10	9	9.5	9	10.5	10	10
FD Fan 2-2 Discharge		12.5	12	11	11.5	11	12.5	12	12
AH 2-1 Air Diff.		2.84	2.7	2.59	2.77	2.67	2.77	2.7	2.66
AH 2-2 Air Diff.		3.73	3.7	3.49	3.6	3.42	3.7	3.7	3.65
Windbox Pressure L		4.2	4	3.6	3.5	3.5	4.5	4.5	4.4
Windbox Pressure R		4.4	4.5	3.8	4.0	4	5	4.5	4.4
WB/Furn. Diff. L		5.0	4.5	4.0	4.5	4	5	5	5
WB/Furn. Diff. R		5.3	5.0	4.2	4.0	4.5	5.5	5	5.2
Furnace Draft		-0.61	-0.5	-0.35	-0.9	-0.5	-0.5	-0.7	-0.45
SH Draft Diff.		2.14	2.0	1.97	2.05	1.96	2.03	2.11	1.98
Econ. Draft Diff.		3.02	2.9	2.78	2.82	2.7	2.97	2.9	2.84
AH 2-1 Gas Diff.		12.4	12	11.2	12	11	11.5	11.5	11
AH 2-2 Gas Diff.		12.6	12.5	11.7	12.5	12	12.5	12.5	12.4
ID Fan 2-1 Inlet		-15.0	-14	-13.7	-15	-13	-14.6	-14	-13.7
ID Fan 2-2 Inlet		-15.5	-15	-14.21	-15	-14	-15.7	-15	-15.0
Atm. Barometric "Hg		24.60	24.60	24.56	24.53	24.52	24.65	24.65	24.64

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		17	18	19	20	21	22	23	24
Date	1981	8/6	8/6	8/6	8/6	8/6	8/10	8/10	8/10
FLOWS, 10E3 LB/HR									
Air Flow		2986	2987	3200	3158	2993	3328	3575	2851
Feedwater		2891	2831	2857	2859	2873	2848	2821	2894
Main Steam		2753	2752	2742	2753	2750	2757	2745	2758
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		0	0	0	0	0	0	0	0
Stm. AH Extr.		0	0	0	0	0	8.9	6.2	9.5
Stm. AH Aux.		0	0	0	0	0	0	10.3	0
Condensate Flow		2241	2180	2125	2193	2211	2201	2195	2199
Superheat Spray L		0	0	0	0	0	0	30	0
Superheat Spray R		0	0	0	0	0	0	0	0
Reheat Spray		0	0	0	0	0	0	0	0
PRESSURES Steam & Water, Psig									
Boiler Drum		2660	2644	2653	2651	2652	2634	2644	2650
Throttle Steam		2404	2339	2398	2396	2397	2386	2398	2348
Turbine 1st Stage		1709	1699	1704	1705	1704	1695	1704	1703
Turbine Cold Reheat		541	537	540	542	541	537	542	542
Reheat Inlet		501	498	500	501	501	497	502	502
Extr. Steam (HP-FW)		533	530	532	533	532	530	535	534
Main Steam		2412	2398	2407	2405	2404	2399	2404	2406
Aux. Steam		342	341	343	341	343	334	337	341
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		9	8.5	10	9.5	8	10	11	8
FD Fan 2-2 Discharge		12	10	12	11	9.5	12.5	13	9.5
AH 2-1 Air Diff.		2.3	2.3	2.6	2.6	2.3	2.8	3.17	2.1
AH 2-2 Air Diff.		3.2	3.2	3.5	3.6	3.1	3.5	3.8	2.7
Windbox Pressure L		4.4	4.4	4.4	3.5	3.5	4.1	4.2	3.4
Windbox Pressure R		4.4	4.4	4.5	4	3.5	4.2	4.2	3.5
WB/Furn. Diff. L		5.2	4.8	5.	4.5	4.	4.9	4.8	4.0
WB/Furn. Diff. R		5.2	5.0	5.	5	4.	5.0	5.2	4.4
Furnace Draft		-0.3	-0.5	-0.5	-0.6	-0.5	-0.8	-0.5	-0.5
SH Draft Diff.		1.7	1.7	1.9	1.8	1.6	2.04	2.3	1.51
Econ. Draft Diff.		2.5	2.4	2.7	2.7	2.4	3.01	3.3	2.3
AH 2-1 Gas Diff.		10.4	9.5	11	11	9.5	12.0	13	9.5
AH 2-2 Gas Diff.		11.4	10.5	12	12.5	11	13.5	14.5	10.5
ID Fan 2-1 Inlet		-12.6	-11.7	-13	-13	-12	-14	-16	-11
ID Fan 2-2 Inlet		-13.8	-13.1	-14	-14	-13	-16	-17	-12
Atm. Barometric "Hg		24.63	24.60	24.59	24.57	24.56	24.64	24.60	24.61

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		25	26	27	28	29	30	31	32
Date	1981	8/10	8/11	8/11	8/11	8/11	8/11	8/11	8/11
FLOWS, 10E3 LB/HR									
Air Flow		2855	3421	3435	3349	2918	3321	3395	3247
Feedwater		2836	2912	2895	2926	2917	2840	2923	2914
Main Steam		2753	2761	2754	2768	2768	2748	2772	2779
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		0	0	0	0	0	0	0	0
Stm. AH Extr.		8.6	15.5	16	15	11	10.47	12	12
Stm. AH Aux.		0	0	0	0	0	0	0	11
Condensate Flow		2217	2222	2266	2188	2248	2196	2209	2257
Superheat Spray L		41	15.2	0	0	0	25.8	0	0
Superheat Spray R		16	0	0	0	0	0	0	0
Reheat Spray		35	0	0	0	0	0	0	0
PRESSURES Steam & Water, Psig									
Boiler Drum		2645	2672	2639	2647	2647	2645	2641	2651
Throttle Steam		2395	2419	2389	2395	2399	2399	2392	2401
Turbine 1st Stage		1704	1718	1702	1705	1708	1708	1704	1710
Turbine Cold Reheat		548	544	540	541	544	542	540	543
Reheat Inlet		508	504	500	501	504	502	500	502
Extr. Steam (HP-FW)		540	536	532	533	536	534	533	535
Main Steam		2407	2427	2401	2405	2408	2410	2403	2413
Aux. Steam		341	337	340	341	339	339	337	336
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		7.5	10.7	11	10.5	8	10.5	10	10
FD Fan 2-2 Discharge		9.5	12.7	13	12.7	9	12.5	12	12
AH 2-1 Air Diff.		2.1	2.86	2.8	2.09	2.1	2.8	2.8	2.7
AH 2-2 Air Diff.		2.7	3.55	3.7	3.7	2.7	3.5	3.4	3.4
Windbox Pressure L		3	4.2	4.5	4.5	3.0	4.4	4.4	4.4
Windbox Pressure R		3.2	4.3	4.5	4.7	3.5	4.6	4.6	4.7
WB/Furn. Diff. L		3.4	4.6	5.0	4.7	3.5	5.0	4.8	4.7
WB/Furn. Diff. R		3.6	4.8	5.3	5.3	4.0	5.6	5.0	5.2
Furnace Draft		-0.6	-0.3	-0.5	-0.2	-0.6	-0.8	-0.5	-0.3
SH Draft Diff.		1.5	2.1	2.	1.9	1.5	1.9	1.9	2.0
Econ. Draft Diff.		2.3	2.9	3.	3.0	2.3	2.9	2.9	2.9
AH 2-1 Gas Diff.		9	12	12	11.5	9	11.5	11	11
AH 2-2 Gas Diff.		10.2	13	13.5	13.0	10.5	13.4	13	12.5
ID Fan 2-1 Inlet		-11	-14	-14	-14	-11	-14	-14	-13
ID Fan 2-2 Inlet		-13	-16	-16	-16	-13	-16	-15	-15
Atm. Barometric "Hg		24.59	24.62	24.62	24.62	24.61	24.60	24.59	24.58

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		33	34	35	36	37	38	39	40
Date	1981	8/12	8/12	8/12	8/12	8/12	8/12	8/12	8/13
FLOWS, 10E3 LB/HR									
Air Flow		3607	3580	3519	3052	3053	3205	3493	2633
Feedwater		2960	2080	3039	3067	3017	3047	3039	2961
Main Steam		2891	2906	2916	2910	2885	2879	2889	2902
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		0	0	0	0	0	0	0	35
Stm. AH Extr.		11	11	9.2	8	6.4	5.5	0	16
Stm. AH Aux.		13	0	0	0	0	0	0	0
Condensate Flow		2337	2418	2317	2291	2253	2383	2312	2301
Superheat Spray L		53	18	0	0	0	0	0	0
Superheat Spray R		25	0	0	0	0	0	0	0
Reheat Spray		22	0	0	0	0	30	0	0
PRESSURES Steam & Water, Psig									
Boiler Drum		2677	2689	2694	2665	2664	2672	2674	2685
Throttle Steam		2405	2412	2417	2389	2389	2398	2397	2410
Turbine 1st Stage		1802	1808	1812	1791	1791	1796	1797	1804
Turbine Cold Reheat		577	574	575	569	570	575	570	573
Reheat Inlet		535	531	532	527	527	533	528	531
Extr. Steam (HP-FW)		568	565	566	560	561	565	561	564
Main Steam		2415	2423	2429	2402	2401	2408	2409	2420
Aux. Steam		339	338	344	339	341	340	341	340
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		12.5	10.5	11	8.5	9.5	10	11	11
FD Fan 2-2 Discharge		14	12.5	13.5	10.0	11.5	12.5	13	13.5
AH 2-1 Air Diff.		3.3	3.1	3.0	2.4	2.5	2.7	2.9	3.2
AH 2-2 Air Diff.		4.1	3.8	3.8	3.0	3.2	3.4	3.8	3.9
Windbox Pressure L		4.5	4.1	4.5	3.0	4.4	4.5	4.2	4.5
Windbox Pressure R		4.5	4.3	4.5	3.5	4.5	4.5	4.5	4.5
WB/Furn. Diff. L		4.7	4.8	5	4	5.0	5.0	4.7	5.0
WB/Furn. Diff. R		5.0	5.3	5	4	5.5	5.0	4.9	5.0
Furnace Draft		-0.3	-0.4	-0.6	-0.5	-0.4	-0.8	-0.5	-0.6
SH Draft Diff.		2.4	2.3	2.3	1.7	1.8	1.9	2.1	2.3
Econ. Draft Diff.		3.4	3.3	3.2	2.5	2.6	2.8	3.1	3.4
AH 2-1 Gas Diff.		14	14	13.	10.5	10.3	12	13	13.5
AH 2-2 Gas Diff.		14	14.5	13.	11.	10.8	12.5	13.4	13.5
ID Fan 2-1 Inlet		-17	-16.7	-16	-13	-13	-14	-16	-17
ID Fan 2-2 Inlet		-17	-16.6	-16	-13	-13	-14	-16	-17
Atm. Barometric "Hg		24.50	24.48	24.47	24.46	24.45	24.43	24.42	24.49

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		41	42	43	44	45	46	47	48
Date	1981	8/13	8/13	8/13	8/13	8/14	8/14	8/14	8/14
FLOWS, 10E3 LB/HR									
Air Flow		3298	3010	3400	3505	3479	3693	3666	3368
Feedwater		2929	2915	2897	2920	2910	2830	2814	2797
Main Steam		2873	2881	2890	2888	2877	2780	2769	2758
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		35	33	33	32	32.83	28	28	27
Stm. AH Extr.		8.2	5.9	5.0	5.5	8.7	15	10	7
Stm. AH Aux.		0	0	5.0	0	0	11	0	0
Condensate Flow		2334	2347	2372	2315	2330	2195	2259	2189
Superheat Spray L		0	16	20	28	NA	0	0	0
Superheat Spray R		0	0	0	0	NA	0	0	0
Reheat Spray		0	25	35	29	NA	0	0	0
PRESSURES									
Steam & Water, Psig									
Boiler Drum		2667	2670	2674	2673	2670	2666	2669	2651
Throttle Steam		2393	2396	2400	2400	2396	2415	2415	2397
Turbine 1st Stage		1792	1796	1799	1800	1796	1718	1718	1708
Turbine Cold Reheat		569	574	574	576	574	543	542	539
Reheat Inlet		526	532	532	534	532	503	501	499
Extr. Steam (HP-FW)		560	565	565	567	565	535	533	531
Main Steam		2403	2409	2411	2414	2409	2423	2422	2408
Aux. Steam		339	338	344	339	341	340	341	340
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		10.5	9	11	10.3	10.6	12	12	9.5
FD Fan 2-2 Discharge		12.5	11	13	13	13.0	14.5	14.5	11.8
AH 2-1 Air Diff.		2.7	2.4	3.0	3.0	3.0	3.3	3.3	2.9
AH 2-2 Air Diff.		3.5	3.0	3.8	3.8	3.8	4.2	4.1	3.6
Windbox Pressure L		4.5	4	4.0	4.0	4.4	4.2	4.2	3.6
Windbox Pressure R		4.5	4	4.2	4.2	4.7	4.4	4.8	4.0
WB/Furn. Diff. L		5	4.5	4.8	4.6	4.7	5.0	4.7	4.1
WB/Furn. Diff. R		5	4.5	5.2	5.2	5.5	5.4	5.5	4.7
Furnace Draft		-0.5	-0.5	-0.5	-0.6	-0.4	-0.7	-0.2	-0.7
SH Draft Diff.		2.0	1.7	2.2	2.1	2.1	7.2	2.1	1.9
Econ. Draft Diff.		2.9	2.5	3.1	3.1	3.1	3.4	3.3	2.8
AH 2-1 Gas Diff.		12.5	10.5	12.2	12.4	12.6	13.5	13.4	13.7
AH 2-2 Gas Diff.		12.5	11.0	12.4	12.7	12.8	13.7	13.7	12.2
ID Fan 2-1 Inlet		-15	-13	-16	-16	-15	-17	-16	-14
ID Fan 2-2 Inlet		-15	-13	-16	-16	-15	-17	-16	-14
Atm. Barometric "Hg		24.49	24.48	24.46	24.47	24.48	24.61	24.60	24.59

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		49	50	51	52	53	54	55	56
Date	1981	8/14	8/14	8/14	8/17	8/17	8/17	8/17	8/17
FLOWS, 10E3 LB/HR									
Air Flow		3257	3256	3325	2781	2443	2820	2783	2739
Feedwater		2816	2795	2760	2046	2132	2063	2103	2129
Main Steam		2765	2743	2746	2111	2109	2078	2095	2112
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		28	26.0	26	25	25	25	25	26
Stm. AH Extr.		0	0	0	20	17	26	20	24
Stm. AH Aux.		8	0	0	0	0	0	0	10
Condensate Flow		2208	2217	2218	1859	1882	1850	1800	1842
Superheat Spray L		0	0	0	33	0	0	0	0
Superheat Spray R		0	0	0	20	0	0	0	0
Reheat Spray		0	0	0	0	0	0	0	0
PRESSURES									
Steam & Water, Psig									
Boiler Drum		2654	2642	2648	2568	2559	2551	2551	2552
Throttle Steam		2399	2387	2393	2417	2406	2399	2399	2399
Turbine 1st Stage		1709	1701	1705	1274	1265	1259	1261	1264
Turbine Cold Reheat		540	538	540	411	405	403	403	405
Reheat Inlet		500	498	500	380	375	373	374	375
Extr. Steam (HP-FW)		532	530	532	406	400	398	399	400
Main Steam		2408	2396	2403	2414	2403	2398	2396	2396
Aux. Steam		340	342	342	342	339	342	342	341
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		9.5	9.5	10.1	7.7	6.6	9.0	7.1	7.1
FD Fan 2-2 Discharge		11.5	11.5	12.3	9.3	7.9	10.5	9.0	9.0
AH 2-1 Air Diff.		2.8	2.7	2.9	2.0	1.7	2.1	2.1	1.9
AH 2-2 Air Diff.		3.4	3.5	3.6	3.0	2.2	2.8	2.7	2.6
Windbox Pressure L		3.2	3.0	4.2	3.8	3.0	4.6	2.9	2.9
Windbox Pressure R		3.7	3.4	4.4	4.0	3.2	4.8	3.1	3.2
WB/Furn. Diff. L		3.8	3.4	4.7	1.4	3.3	4.8	3.4	3.4
WB/Furn. Diff. R		4.5	4.0	5.1	4.8	3.9	5.3	3.8	3.9
Furnace Draft		-0.4	-0.3	-0.6	-0.7	-0.6	-0.5	-0.5	-0.6
SH Draft Diff.		1.8	1.9	2.0	1.3	1.1	1.4	1.4	1.3
Econ. Draft Diff.		2.8	2.8	3.0	1.9	1.7	2.1	2.0	2.0
AH 2-1 Gas Diff.		11.4	11.1	12.3	8.2	7.5	8.7	8.5	8.4
AH 2-2 Gas Diff.		11.7	11.6	12.3	8.7	8.1	9.2	9.1	9.0
ID Fan 2-1 Inlet		-14	-13.8	-14.7	-10.3	-9.1	-10.6	-10.2	-10.2
ID Fan 2-2 Inlet		-14	-14.2	-14.9	-10.6	-9.6	-11.1	-10.5	-10.6
Atm. Barometric "Hg		24.58	24.57	24.56	24.50	24.50	24.50	24.50	24.51

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		57	58	59	60	61	61	63	64
Date	1981	8/17	8/17	8/17	8/18	8/18	8/18	8/18	8/18
FLOWS, 10E3 LB/HR									
Air Flow		2618	2635	2525	2521	2405	2750	2732	2490
Feedwater		2128	2119	1973	1970	1937	1927	2007	1985
Main Steam		2106	2117	2052	2055	2040	2040	2049	2049
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		25	26	24	24	25	25	25	25
Stm. AH Extr.		21	24	6	16	11	23	23	23
Stm. AH Aux.		8	0	0	12	0	0	11	13
Condensate Flow		1868	1702	1690	1766	1656	1766	1915	1686
Superheat Spray L		0	0	38	54	61	56	31	31
Superheat Spray R		0	0	23	36	32	38	22	20
Reheat Spray		0	0	0	0	0	0	0	0
PRESSURES Steam & Water, Psig									
Boiler Drum		2557	2552	2534	2557	2545	2538	2542	2545
Throttle Steam		2404	2400	2386	2413	2401	2397	2397	2402
Turbine 1st Stage		1265	1264	1236	1238	1230	1228	1228	1232
Turbine Cold Reheat		407	405	399	402	399	398	396	397
Reheat Inlet		376	375	370	373	370	369	367	368
Extr. Steam (HP-FW)		401	400	395	398	395	394	392	393
Main Steam		2400	2396	2384	2410	2400	2393	2394	2400
Aux. Steam		337	339	342	339	340	338	341	340
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		6.5	6.5	NA	7.0	5.9	8.5	7.6	6.5
FD Fan 2-2 Discharge		8.5	8.2	NA	8.9	7.4	10.0	8.4	7.9
AH 2-1 Air Diff.		1.8	1.8	1.7	1.7	1.6	2.0	2.0	1.6
AH 2-2 Air Diff.		2.4	2.4	2.1	2.2	2.0	2.5	2.5	2.2
Windbox Pressure L		2.6	2.8	2.0	3.5	3.8	4.2	3.4	2.8
Windbox Pressure R		3.9	3.2	2.1	3.6	2.8	4.2	3.6	3.0
WB/Furn. Diff. L		3.1	3.2	2.5	3.8	3.1	4.9	3.7	3.4
WB/Furn. Diff. R		3.6	3.8	2.9	4.1	3.4	5.1	4.2	3.8
Furnace Draft		-0.2	-0.7	-0.5	-0.5	-0.75	-0.6	-0.4	-0.4
SH Draft Diff.		1.2	1.2	1.2	1.2	1.1	1.4	1.3	1.1
Econ. Draft Diff.		1.8	1.8	1.8	1.8	1.7	2.1	2.0	1.7
AH 2-1 Gas Diff.		7.7	8.0	8.0	7.6	6.7	8.6	8.4	7.6
AH 2-2 Gas Diff.		8.4	8.3	8.6	8.2	7.4	9.1	8.8	8.3
ID Fan 2-1 Inlet		-9.2	-9.6	-9.5	-9.2	-9.	-10.6	-10.	-9.1
ID Fan 2-2 Inlet		-9.5	-9.9	-9.8	-9.7	-9.4	-10.8	-11.	-9.5
Atm. Barometric "Hg		24.52	24.52	24.49	24.49	24.49	24.49	24.49	24.51

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		1	2	3	4	5	6	7	8
Date	1981	8/3	8/3	8/3	8/3	8/4	8/4	8/4	8/4
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		70	70	65	80	70	70	70	70
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		70	70	65	80	70	70	70	70
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		74	75	73	81	80	78	75	72
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		74	75	73	81	75	72	70	70
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		18	0	0	0	0	0	0	0
SH Spray R		5	0	0	0	0	0	0	0
RH Spray		0	0	0	0	0	0	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		73	72	75.1	75	80	78	78	79
Coal Flow 2-2		73	72	75	75	80	78	78	78
Coal Flow 2-3		73	73	76	76	80	79	79	79
Coal Flow 2-4		73	72	75	75	48	49	49	49
Coal Flow 2-5		53	53	53	53	62	62	62	62
Coal Air Temp. 2-1, °F		163	164	164	164	162	164	164	164
Coal Air Temp. 2-2		161	162	161	161	162	164	164	163
Coal Air Temp. 2-3		162	162	163	163	161	163	162	162
Coal Air Temp. 2-4		163	163	163	163	156	164	164	164
Coal Air Temp. 2-5		163	163	163	163	163	163	163	163
Mill 2-1	Amps	72	72	72	72	74	73	74	74
Mill 2-2		74	71	73	73	72	74	72	72
Mill 2-3		70	72	71	73	76	74	74	75
Mill 2-4		71	71	71	70	64	66	66	64
Mill 2-5		68	66	67	66	70	71	71	69
Exh. Discharge	"H_2O								
Mill 2-1		9	8	9	9	8.5	9	8.5	8.5
Mill 2-2		7	7	7	8	7.5	7.5	7.5	7.5
Mill 2-3		8	.5	7	8	8.2	8	8	8
Mill 2-4		8	7	8	8	8.2	7	7.5	7
Mill 2-5		7	6.5	7	7	8.2	8	8	8
Diff. Press. 2-1	"H_2O	7	6.5	7.5	6.5	6	8.5	7	7
Diff. Press. 2-2		7	6.6	6	6.5	6	7.5	6.5	6.5
Diff. Press. 2-3		7	6.5	6.2	7.6	6	8	7	6.5
Diff. Press. 2-4		7	7.5	7	7	6	7	6.5	6.5
Diff. Press. 2-5		6	6	6	6	6	8	6.5	6
Mill 2-1 Suction		-2	2	1.8	1.8	1.9	1.8	1.8	1.9
Mill 2-2 Suction		-2	2	1.8	1.7	2	2	2.2	2.2
Mill 2-3 Suction		-1.5	1.8	1.8	1.5	1.7	1.4	1.7	2.7
Mill 2-4 Suction		-1.5	1.8	1.8	1.5	2.5	2.3	2.3	2.5
Mill 2-5 Suction		-2.2	1.8	2.2	2.2	2	2	2.5	2.2
Mill 2-1 Feeder Speed % Full		72	72	75	75	72	83	79	79
Mill 2-2 Feeder Speed		72	72	75	75	72	83	80	79
Mill 2-3 Feeder Speed		72	72	75	75	72	83	80	79
Mill 2-4 Feeder Speed		72	72	75	75	59	48	50	50
Mill 2-5 Feeder Speed		55	55	55	56	63	63	64	64

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		9	10	11	12	13	14	15	16
Date	1981	8/5	8/5	8/5	8/5	8/5	8/6	8/6	8/6
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		72	70	70	70	69	70	70	70
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		72	70	70	70	69	70	70	70
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		74	73	78	72	75	78	70	78
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		72	72	74	70	72	76	70	76
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		19	5	8	21	21	0	0	0
SH Spray R		9	0	0	16	18	0	0	0
RH Spray		0	0	0	0	0	0	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		73	72	71	71	70	72	70	71
Coal Flow 2-2		73	71	70	70	70	72	70	71
Coal Flow 2-3		73	72	71	71	71	73	70	71
Coal Flow 2-4		73	71	70	71	70	72	70	71
Coal Flow 2-5		61	61	61	61	61	62	61	62
Coal Air Temp. 2-1, °F		163	163	164	164	163	164	163	164
Coal Air Temp. 2-2		163	163	164	164	164	164	164	164
Coal Air Temp. 2-3		162	162	162	162	162	162	162	163
Coal Air Temp. 2-4		163	164	162	164	165	164	164	164
Coal Air Temp. 2-5		163	163	163	163	163	164	163	163
Mill 2-1	Amps	72	72	72	72	72	71	71	71
Mill 2-2		71	72	70	70	70	69	70	70
Mill 2-3		69	69	70	70	70	71	71	68
Mill 2-4		70	71	69	71	69	70	70	70
Mill 2-5		70	70	70	70	69	69	70	69
Exh. Discharge	"H_2O								
Mill 2-1		8.5	8	8.5	8.5	8.5	8.5	8.5	8.2
Mill 2-2		7.0	7	7	7.5	7	7	7	6.5
Mill 2-3		8.0	7.5	7.7	8	8	7.5	7.5	7.5
Mill 2-4		8.0	7.5	7.7	7.5	7.5	7.5	7.5	7.5
Mill 2-5		8.0	8	8	8	7.5	8	8	8
Diff. Press. 2-1	"H_2O	7	7	6.5	7	7	7	7	7
Diff. Press. 2-2		7	6.5	6.5	6.5	6.5	6.5	6.5	7
Diff. Press. 2-3		7	7	6.5	7	6.5	7	7	7
Diff. Press. 2-4		7	7	7	7	7	7	7	7
Diff. Press. 2-5		7	6.5	6.3	6.5	6.5	7	6.5	6.5
Mill 2-1 Suction		1.8	2	2	1.9	2	2	2	1.9
Mill 2-2 Suction		1.9	2	2.2	2.2	2.2	2.2	2.2	2
Mill 2-3 Suction		1.7	1.8	1.8	1.7	1.9	1.9	1.9	1.8
Mill 2-4 Suction		1.8	1.8	1.8	1.9	2	1.9	1.9	1.7
Mill 2-5 Suction		2.1	2.2	2.2	2.2	1.8	2	2.3	2.1
Mill 2-1 Feeder Speed % Full		72	72	72	72	71	70	70	70
Mill 2-2 Feeder Speed		72	70	72	71	71	70	70	70
Mill 2-3 Feeder Speed		72	71	72	71	71	70	70	70
Mill 2-4 Feeder Speed		72	70	72	71	70	70	70	70
Mill 2-5 Feeder Speed		63	64	63	64	64	64	64	63

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		17	18	19	20	21	22	23	24
Date	1981	8/6	8/6	8/6	8/6	8/6	8/10	8/10	8/10
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		67	68	70	70	65	70	72	62
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		67	68	70	70	65	70	72	62
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		75	72	71	70	73	78	74	66
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		74	70	70	69	71	78	75	67
ID Fan 2-2 Outlet		102	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		0	0	0	0	0	0	11	0
SH Spray R		0	0	0	0	0	0	0	0
RH Spray		0	0	0	0	0	0	6	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		69	70	69	70	70	70	70	69
Coal Flow 2-2		69	70	70	70	70	70	71	70
Coal Flow 2-3		69	71	70	71	70	71	71	70
Coal Flow 2-4		69	70	70	70	70	71	71	70
Coal Flow 2-5		62	62	61	62	62	63	63	63
Coal Air Temp. 2-1, °F		164	164	164	164	164	160	161	160
Coal Air Temp. 2-2		164	164	164	164	163	161	161	161
Coal Air Temp. 2-3		162	162	162	163	162	160	160	160
Coal Air Temp. 2-4		163	164	164	164	163	161	161	161
Coal Air Temp. 2-5		163	164	163	164	163	160	160	160
Mill 2-1	Amps	72	71	71	71	72	71	72	71
Mill 2-2		70	72	70	68	72	70	69	71
Mill 2-3		70	72	71	69	69	69	71	70
Mill 2-4		70	70	69	69	68	70	69	70
Mill 2-5		69	69	68	69	70	70	70	70
Exh. Discharge	"H_2O								
Mill 2-1		8.8	8.5	7	8.5	8.5	8	8.2	8.5
Mill 2-2		6.2	6.5	7.5	6.5	7	6.5	7	6.5
Mill 2-3		7.7	8	7.5	8	7.5	8	8	8
Mill 2-4		7.7	7.7	7.7	8	7.5	8	8	8
Mill 2-5		7.9	7.9	7.7	8	8	8	8	8
Diff. Press. 2-1	"H_2O	7.5	7	6.5	6.5	7	7	7	7
Diff. Press. 2-2		7.5	7	7	7	7	7	7	6.5
Diff. Press. 2-3		7.2	7	7	7	7	7	7	6.5
Diff. Press. 2-4		7.2	7	7	7	7	7	7	7
Diff. Press. 2-5		7.0	7	6.5	6.3	6	7	7	6.5
Mill 2-1 Suction		2.0	2	2.1	2.0	2	1.9	1.9	2.0
Mill 2-2 Suction		2.0	2.1	2.2	2.2	2.2	2.1	2.1	2.1
Mill 2-3 Suction		1.7	1.9	1.9	1.9	2	1.8	1.8	1.9
Mill 2-4 Suction		1.8	1.9	1.9	2.0	2	1.8	1.8	1.9
Mill 2-5 Suction		2.1	2.2	2.2	2.3	2.2	2.1	2.1	2.2
Mill 2-1 Feeder Speed % Full		69	70	70	70	71	69	72	69
Mill 2-2 Feeder Speed		69	70	70	70	71	70	72	70
Mill 2-3 Feeder Speed		69	70	70	70	70	69	72	69
Mill 2-4 Feeder Speed		69	70	70	69	70	69	72	69
Mill 2-5 Feeder Speed		63	63	64	64	64	64	63	63

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		25	26	27	28	29	30	31	32
Date	1981	8/10	8/11	8/11	8/11	8/11	8/11	8/11	8/11
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		63	72	70	70	63	69	70	69
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		63	71	70	70	63	70	69	69
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		69	76	72	72	68	73	76	71
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		69	76	72	72	69	75	77	71
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		26	0	0	0	0	0	0	0
SH Spray R		0	0	0	0	0	0	0	0
RH Spray		28	0	0	0	0	4	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		70	70	73	71	69	68	71	69
Coal Flow 2-2		71	70	73	72	70	69	72	70
Coal Flow 2-3		71	71	73	72	70	69	72	70
Coal Flow 2-4		71	70	73	72	70	69	72	70
Coal Flow 2-5		62	62	62	62	62	62	62	62
Coal Air Temp. 2-1, °F		160	161	161	161	161	161	161	162
Coal Air Temp. 2-2		160	161	160	161	161	161	162	162
Coal Air Temp. 2-3		160	161	160	161	161	161	161	161
Coal Air Temp. 2-4		160	159	160	161	161	161	162	162
Coal Air Temp. 2-5		159	159	159	159	161	161	161	162
Mill 2-1	Amps	72	72	71	72	72	73	72	71
Mill 2-2		69	71	70	70	69	72	69	71
Mill 2-3		70	70	71	70	70	71	70	70
Mill 2-4		69	71	70	71	71	71	70	69
Mill 2-5		70	70	71	70	70	70	70	69
Exh. Discharge	"H_2O								
Mill 2-1		8.2	8.5	8.2	8.5	8	7	9	8.5
Mill 2-2		7	6.5	6.5	6.5	6.5	7	7	7
Mill 2-3		8	7.7	7.7	8	7.5	8	7	8
Mill 2-4		7.8	7.7	7.5	7	7.5	8	7	8
Mill 2-5		8	8.0	8.0	7.8	7.5	8	8	8
Diff. Press. 2-1	"H_2O	7	7	7	7	7	7	7	7
Diff. Press. 2-2		6.5	7	7	7	6.5	7	7	7
Diff. Press. 2-3		7	7	7.5	7	7	7	7	7
Diff. Press. 2-4		7	7	7	7	7	7	7	7
Diff. Press. 2-5		6.5	7	7	6.7	6.5	7	7	7
Mill 2-1 Suction		2	1.7	1.8	1.8	2.0	1.8	1.8	1.8
Mill 2-2 Suction		2.2	1.9	2.0	2.0	2.1	1.9	1.9	1.9
Mill 2-3 Suction		2.1	1.6	1.7	1.8	1.9	1.7	1.7	1.7
Mill 2-4 Suction		2.1	1.5	1.8	1.8	2.0	1.6	1.7	1.8
Mill 2-5 Suction		2.3	2.1	2.0	2.1	2.3	2.0	2.1	2.1
Mill 2-1 Feeder Speed % Full		70	72	70	69	70	72	70	70
Mill 2-2 Feeder Speed		70	72	70	70	70	72	70	70
Mill 2-3 Feeder Speed		70	72	70	70	70	72	70	70
Mill 2-4 Feeder Speed		70	72	70	70	70	72	70	70
Mill 2-5 Feeder Speed		65	63	63	63	64	63	63	63

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		33	34	35	36	37	38	39	40
Date	1981	8/12	8/12	8/12	8/12	8/12	8/12	8/12	8/13
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		72	72	71	65	65	69	71	73
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		72	72	72	67	68	70	72	75
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		76	80	80	73	73	75	75	77
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		74	75	76	70	69	73	72	73
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		24	2	0	0	0	0	0	0
SH Spray R		24	0	0	0	0	0	0	0
RH Spray		24	0	0	0	0	22	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		74	72	71	73	73	73	73	77
Coal Flow 2-2		75	73	71	73	73	73	73	77
Coal Flow 2-3		75	73	72	74	74	74	73	78
Coal Flow 2-4		75	73	71	73	73	73	73	77
Coal Flow 2-5		62	62	61	61	62	62	62	62
Coal Air Temp. 2-1, °F		162	161	162	161	161	161	162	162
Coal Air Temp. 2-2		162	162	162	161	161	161	162	162
Coal Air Temp. 2-3		162	161	162	161	162	162	162	162
Coal Air Temp. 2-4		162	161	162	161	162	161	162	163
Coal Air Temp. 2-5		161	161	161	160	161	162	161	161
Mill 2-1	Amps	74	73	72	74	73	73	73	74
Mill 2-2		71	71	71	71	73	70	71	72
Mill 2-3		71	70	72	70	71	70	70	71
Mill 2-4		72	71	71	71	69	72	71	72
Mill 2-5		69	69	69	69	70	69	70	70
Exh. Discharge	"H_2O								
Mill 2-1		8.2	8.5	8.5	8.5	8.5	8	8	8.5
Mill 2-2		6.2	7	7	7	7	7	7	7
Mill 2-3		8	8	8	7.5	8	7.5	8	8
Mill 2-4		7.5	7.7	7.5	7.5	7.8	7.5	7.5	8
Mill 2-5		7.7	8	8	8.0	8	8	8	7.5
Diff. Press. 2-1	"H_2O	7	7	7	7.0	7	7	7	7
Diff. Press. 2-2		7	6.5	7	6.5	7	6.5	7	7
Diff. Press. 2-3		7	7	7	7.0	7	7	7	7
Diff. Press. 2-4		7	7	7	6.5	7	7	7	7
Diff. Press. 2-5		7	6.5	6.5	6.5	7	6.5	7	6.5
Mill 2-1 Suction		1.9	1.8	1.9	2.0	1.8	1.9	1.9	1.8
Mill 2-2 Suction		1.9	1.9	2.0	2.2	2.0	1.9	2.0	2.0
Mill 2-3 Suction		1.8	1.6	1.8	1.9	1.8	1.8	1.9	1.6
Mill 2-4 Suction		1.5	1.5	1.8	1.9	1.7	1.8	1.8	1.8
Mill 2-5 Suction		2.0	2.0	2.1	1.8	2.1	2.1	2.1	[illegible]
Mill 2-1 Feeder Speed % Full		74	74	72	73	73	72	73	76
Mill 2-2 Feeder Speed		74	74	72	74	73	72	73	[illegible]
Mill 2-3 Feeder Speed		74	74	72	73	73	72	73	76
Mill 2-4 Feeder Speed		74	74	72	74	73	72	73	76
Mill 2-5 Feeder Speed		63	63	64	64	63	64	63	64

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		41	42	43	44	45	46	47	48
Date	1981	8/13	8/13	8/13	8/13	8/13	8/14	8/14	8/14
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		69	65	73	72	71	75	75	70
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		70	66	74	73	72	77	76	71
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		73	70	80	78	76	82	80	77
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		71	66	75	73	72	77	76	73
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		0	6	8	16	8	0	0	0
SH Spray R		0	0	0	18	3	0	0	0
RH Spray		0	20	30	25	24	0	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		76	76	74	76	75	76	74	75
Coal Flow 2-2		76	76	75	76	76	76	74	75
Coal Flow 2-3		77	76	75	77	76	76	74	76
Coal Flow 2-4		76	76	75	76	76	76	74	76
Coal Flow 2-5		62	62	62	62	62	62	63	63
Coal Air Temp. 2-1, °F		162	162	162	162	162	162	162	162
Coal Air Temp. 2-2		162	161	161	162	162	160	163	162
Coal Air Temp. 2-3		162	162	162	162	162	163	162	162
Coal Air Temp. 2-4		162	162	161	162	162	163	162	163
Coal Air Temp. 2-5		161	161	161	161	162	161	161	161
Mill 2-1	Amps	74	73	74	74	73	73	74	75
Mill 2-2		69	70	70	70	72	73	75	72
Mill 2-3		71	73	72	73	71	74	71	72
Mill 2-4		73	73	73	72	71	73	71	73
Mill 2-5		70	69	70	69	70	70	71	72
Exh. Discharge	"H_2O								
Mill 2-1		8	8	8.5	8.5	8.5	8	8	8.5
Mill 2-2		7	6.5	6.5	7	6.5	8	6.5	6.5
Mill 2-3		8	7.5	8	8	8	7	7	7.0
Mill 2-4		8	7.5	8	8	8	8	8	8.0
Mill 2-5		8	7.5	8	8	8	8	7.5	7.0
Diff. Press. 2-1	"H_2O	7	7	7	7	7	7.5	7.5	7.5
Diff. Press. 2-2		7	7	7	7	7	7.5	8.0	7.5
Diff. Press. 2-3		7	7	7	7	7	7.5	7.5	7.3
Diff. Press. 2-4		7	7	7	7	7	7.0	7.0	7.0
Diff. Press. 2-5		6.5	6.5	7	7	7	7.0	7.0	7.0
Mill 2-1 Suction		1.8	1.9	1.8	1.7	1.8	1.2	1.5	1.5
Mill 2-2 Suction		1.9	2.0	1.9	1.8	1.9	1.6	1.2	1.9
Mill 2-3 Suction		2.1	1.7	1.5	1.5	1.7	1.3	1.3	1.4
Mill 2-4 Suction		1.6	1.8	1.5	1.6	1.5	1.2	1.2	1.5
Mill 2-5 Suction		2.1	1.7	2.1	2.0	2.0	1.9	2.0	2.0
Mill 2-1 Feeder Speed % Full		76	75	75	75	76	75	74	75
Mill 2-2 Feeder Speed		76	76	75	76	77	75	74	75
Mill 2-3 Feeder Speed		76	76	75	76	77	75	74	75
Mill 2-4 Feeder Speed		76	76	75	76	77	75	74	76
Mill 2-5 Feeder Speed		64	64	63	64	64	64	64	64

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		49	50	51	52	53	54	55	56
Date	1981	8/14	8/14	8/14	8/17	8/17	8/17	8/17	8/17
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		69	69	70	60	57	63	61	61
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		70	70	71	62	59	69	63	62
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		72	77	73	70	67	68	70	66
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		69	73	70	66	63	64	67	63
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		0	0	0	23	0	0	0	0
SH Spray R		0	0	0	29	0	0	0	0
RH Spray		0	0	0	0	20	0	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		75	76	75	0	0	0	0	0
Coal Flow 2-2		75	76	75	70	66	68	68	68
Coal Flow 2-3		75	77	75	70	67	68	68	68
Coal Flow 2-4		75	76	75	70	67	68	68	68
Coal Flow 2-5		63	62	62	57	57	57	57	57
Coal Air Temp. 2-1, °F		162	162	162	107	102	98	96	95
Coal Air Temp. 2-2		161	162	161	166	166	166	165	165
Coal Air Temp. 2-3		163	163	162	166	165	166	166	165
Coal Air Temp. 2-4		163	163	163	168	167	166	166	166
Coal Air Temp. 2-5		161	162	160	168	167	169	167	168
Mill 2-1	Amps	74	74	74	0.07	0.07	0.07	0.07	0.07
Mill 2-2		69	71	70	69	68	68	72	70
Mill 2-3		74	76	73	69	69	69	70	69
Mill 2-4		71	71	72	70	69	70	69	70
Mill 2-5		71	74	71	67	67	68	69	68
Exh. Discharge	"H_2O								
Mill 2-1		8.5	8.5	8.5	0	0	0	0	0
Mill 2-2		6.5	7	7	7	6.5	6.5	6.5	6.5
Mill 2-3		7.0	7	8	7.5	7.0	7.0	7.5	7.5
Mill 2-4		6.5	8	8	7.9	7.5	7.5	8	7.5
Mill 2-5		7.0	8	7.5	7.9	7.9	7.5	7.7	7.5
Diff. Press. 2-1	"H_2O	7.5	7.5	7.5	0	0	0	0	0
Diff. Press. 2-2		7.3	7.5	7	7	7	7	7	7
Diff. Press. 2-3		7.3	7.5	7.3	7	7	7	7	7
Diff. Press. 2-4		7.0	7.3	8	7	7	7	7	
Diff. Press. 2-5		7.0	7.0	7	6.5	6.5	6.5	6.5	6.5
Mill 2-1 Suction		1.6	1.6	1.7	1.1	1.1	1.1	1.0	1.2
Mill 2-2 Suction		1.8	1.8	1.9	2.0	2.1	2.1	2.1	2.1
Mill 2-3 Suction		1.5	1.4	1.4	1.8	1.9	1.8	1.8	1.9
Mill 2-4 Suction		1.5	1.5	1.4	1.8	1.9	1.8	1.9	2.0
Mill 2-5 Suction		2.0	2.1	1.9	1.9	2.1	2.0	2.1	2.2
Mill 2-1 Feeder Speed % Full		74	75	76	0	0	0	0	0
Mill 2-2 Feeder Speed		75	75	76	71	69	68	68	67
Mill 2-3 Feeder Speed		75	75	76	70	68	68	68	67
Mill 2-4 Feeder Speed		75	76	76	71	69	68	68	67
Mill 2-5 Feeder Speed		64	64	64	59	59	59	58	59

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		57	58	59	60	61	62	63	64
Date	1981	8/17	8/17	8/17	8/18	8/18	8/18	8/18	8/18
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		59	59	56	59	56	61	61	58
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		60	60	58	60	58	63	62	59
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		72	70	68	66	68	71	67	66
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		67	66	64	63	63	67	63	63
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		0	0	25	32	33	34	24	23
SH Spray R		0	0	30	38	38	40	31	30
RH Spray		0	0	0	0	0	0	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		0	0	54	66	66	65	64	63
Coal Flow 2-2		67	67	54	66	67	65	64	64
Coal Flow 2-3		67	68	55	67	67	66	65	64
Coal Flow 2-4		67	68	54	66	67	65	64	64
Coal Flow 2-5		57	57	50	0	0	0	0	0
Coal Air Temp. 2-1, °F		92	90	161	162	161	162	162	161
Coal Air Temp. 2-2		165	166	164	165	164	164	163	163
Coal Air Temp. 2-3		165	166	165	165	164	164	163	163
Coal Air Temp. 2-4		165	166	165	165	164	163	162	162
Coal Air Temp. 2-5		165	166	167	128	114	104	102	98
Mill 2-1	Amps	0	0	68	71	70	70	71	69
Mill 2-2		67	67	66	68	66	69	69	67
Mill 2-3		68	69	65	70	68	69	70	67
Mill 2-4		70	70	64	69	69	68	68	68
Mill 2-5		68	68	67	0	0	0	0	0
Exh. Discharge	"H_2O								
Mill 2-1		0	0	8	8.5	8	8.0	8	8
Mill 2-2		6.5	6.5	6	6.5	6.5	6.5	6.5	6
Mill 2-3		7.5	7.5	7	7.5	7	7.5	7	7.5
Mill 2-4		7.5	8.0	7	7.5	7.5	7.5	7.5	7.5
Mill 2-5		7.5	7.5	6.5	0	0	0	0	0
Diff. Press. 2-1	"H_2O	0	0	6.5	7	7	7	7	7
Diff. Press. 2-2		7	7	7	7	7	7	7	7
Diff. Press. 2-3		7	7	7	7	7	7	7	7
Diff. Press. 2-4		7	7	7	7	7	7	7	7
Diff. Press. 2-5		6.5	6.5	6	0	0	0	0	0
Mill 2-1 Suction		1.1	1.2	2.3	2.0	2.0	1.9	2.0	2.0
Mill 2-2 Suction		2.1	2.1	2.5	2.0	2.1	2.1	2.2	2.3
Mill 2-3 Suction		2.0	1.9	2.4	1.9	1.9	1.8	1.8	2.0
Mill 2-4 Suction		2.0	1.9	2.2	1.9	1.9	2.0	2.1	2.1
Mill 2-5 Suction		2.1	2.1	2.2	1.1	1.0	0.9	1.0	1.0
Mill 2-1 Feeder Speed % Full		0	0	64	66	66	65	64	64
Mill 2-2 Feeder Speed		77	68	64	66	66	64	64	64
Mill 2-3 Feeder Speed		77	68	64	66	66	64	64	64
Mill 2-4 Feeder Speed		78	68	64	65	66	65	64	64
Mill 2-5 Feeder Speed		59	59	62	0	0	0	0	0

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		1	2	3	4	5	6	7	8
Test Date	1981	8/3	8/3	8/3	8/3	8/4	8/4	8/4	8/4
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		82	89.2	88.7	86.94	83.27	83.9	86	86
FD 2-1 Fan Outlet		91	98.5	99.96	102	99.01	99.9	101	102
FD 2-2 Fan Outlet		89	97	97	99	97.8	99.9	99	101
Stm. AH 2-1 Air Outlet		103	104	104	102	99.4	100.4	101	102
Stm. AH 2-2 Air Outlet		96	104	105	105	105	105	105	108
AH 2-1 Air Inlet		105	111	112	109	107	108	109	110
AH 2-2 Air Inlet		97	106	108	107	108	109	109	112
AH 2-1 Air Outlet		490	493	493	498	501	497	501	498
AH 2-2 Air Outlet		522	526	521	531	526	523	523	522
AH 2-1 Gas Inlet		633	644	626	670	642	644	640	640
AH 2-2 Gas Inlet		674	671	660	693	677	675	669	672
AH 2-1 Gas Outlet		253	253	251	259	261	260	265	263
AH 2-2 Gas Outlet		277	284	283	283	281	278	280	279
Steam & Water, Degrees F									
Feedwater to Economizer		NR	486	NR	488	485	486	487	486
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		655	660	659	660	632	635	626	627
Desuperheater Inlet L		741	733	735	751	632	636	626	627
Desuperheater Inlet R		745	735	738	754	627	631	622	622
Desuperheater Outlet L		730	734	734	740	743	736	734	736
Desuperheater Outlet R		735	731	730	747	743	739	735	735
Throttle Steam		1001	985	1001	1007	1000.4	999	985	989
Reheat-Cold at Turbine		632	629	637	645	661	663	662	665
Reheat Atemp Inlet L		633	629	637	625	748	741	738	736
Reheat Atemp Inlet R		629	626	632	627	747	737	735	737
Reheat Boiler Outlet		1006	992	1014	999	1004	999.66	993	994
HP EXTR Steam Inlet		632	627	636	645	629	634	625	626
HP FW Heater Inlet		410	412	412	412	409	410	411	411
HP FW Heater Drain		421	423	423	423	421	422	422	423
Auxiliary Steam		585	584	580	604	610	610	604	598
Miscellaneous									
Burner Tilt LR ± Deg		11	2.5	-6.2	-20.9	0.35	0.07	0.07	0
Burner Tilt LF ± Deg		11	2.3	-5.7	-19.4	0.29	0.04	0.04	0
Burner Tilt RF ± Deg		11	3.5	-4.9	-19.9	1.3	1.15	1.15	0
Burner Tilt RR ± Deg		11	2.1	-6.3	-20.8	0.12	-0.36	-0.13	0
Flue Gas Oxygen R		4.1	4.23	1.53	4.57	4.76	4.75	3.99	3.98
Flue Gas Oxygen L		3.6	3.41	2.55	5.43	3.08	2.77	3.29	3.57
Flue Gas Oxygen Avg.		4.2	3.8	2.04	4.97	3.92	3.76	3.64	3.79
Drum Level "H_2O		1.14	0.89	1.04	1.07	1.72	0.96	1.22	1.
FD Fan 2-1 Amps		125	125	116	139	125	123	122	121
FD Fan 2-2 Amps		128	128	118	143	129	127	127	124
ID Fan 2-1 Amps		262	263	254	281	267	266	268	264
ID Fan 2-2 Amps		273	272	259	293	268	268	270	266

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		9	10	11	12	13	14	15	16
Test Date	1981	8/5	8/5	8/5	8/5	8/5	8/6	8/6	8/6
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		83	85	90.7	89	90.6	79	85	88
FD 2-1 Fan Outlet		91.7	94.9	100.9	1003	104	87.5	93	96
FD 2-2 Fan Outlet		91.3	93	99	100	102	85	91	94
Stm. AH 2-1 Air Outlet		98.1	98	102	103	104	99	100	101
Stm. AH 2-2 Air Outlet		98.7	102	107	109	110	94	99	102
AH 2-1 Air Inlet		103	106	109	111	112	102	106	106
AH 2-2 Air Inlet		102	106	111	111	113	96	101	105
AH 2-1 Air Outlet		500	498	501	504	505	497	498	497
AH 2-2 Air Outlet		524	523	524	528	528	525	526	525
AH 2-1 Gas Inlet		658	651	651	658	662	652	651	650
AH 2-2 Gas Inlet		689	682	678	681	677	684	683	678
AH 2-1 Gas Outlet		258	257	262	264	265	258	256	255
AH 2-2 Gas Outlet		271	272	279	280	280	277	278	278
Steam & Water, Degrees F									
Feedwater to Economizer		487	486	486	486	487	485	485	485
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		641	659	659	663	662	655	657	659
Desuperheater Inlet L		641	743	743	740	747	744	745	743
Desuperheater Inlet R		637	745	745	751	750	747	746	747
Desuperheater Outlet L		742	741	737	734	730	740	741	744
Desuperheater Outlet R		740	741	742	741	737	743	744	742
Throttle Steam		1008	1002	1004	1004	1009	1008	1007	1007
Reheat-Cold at Turbine		657	636	637	639	643	638	637	636
Reheat Atemp Inlet L		747	636	637	640	643	639	637	637
Reheat Atemp Inlet R		753	632	633	635	639	634	633	632
Reheat Boiler Outlet		1017	1004	1008	1020	1024	1011	1010	1011
HP EXTR Steam Inlet		640	635	636	639	642	637	635	636
HP FW Heater Inlet		411	410	411	411	412	410	409	410
HP FW Heater Drain		422	422	422	423	423	420	420	421
Auxiliary Steam		611	611	612	614	611	618	418	619
Miscellaneous									
Burner Tilt LR ± Deg		10	6.5	5.5	5	5	2	-6	-10.7
Burner Tilt LF ± Deg		9.7	5.0	5.2	5	5	2	-5	-10.0
Burner Tilt RF ± Deg		10.5	5.5	6.3	6	6	3	-5	-9.4
Burner Tilt RR ± Deg		10.2	6.4	5.4	5	5	2	-6	-10.9
Flue Gas Oxygen R		3.50	4.19	3.99	4.01	3.8	3.4	3.1	2.80
Flue Gas Oxygen L		4.32	3.76	3.48	3.84	3.6	4.4	4.6	4.79
Flue Gas Oxygen Avg.		3.86	4.00	3.73	3.92	3.7	3.88	3.9	3.80
Drum Level	"H_2O	0.86	+0.5	0.86	1.4	1.07	0.89	0.8	1.12
FD Fan 2-1	Amps	126	123	120	122	119	125	124	122
FD Fan 2-2	Amps	129	126	123	126	123	129	128	127
ID Fan 2-1	Amps	274	266	266	268	264	268	266	268
ID Fan 2-2	Amps	275	267	270	267	266	274	274	273

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		17	18	19	20	21	22	23	24
Test Date	1981	8/6	8/6	8/6	8/6	8/6	8/10	8/10	8/10
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		87	91	92	90	95	64.7	70	61
FD 2-1 Fan Outlet		99.5	101	103	104	106	79.5	83.8	77
FD 2-2 Fan Outlet		97	101	101	102	103	79.3	84	77
Stm. AH 2-1 Air Outlet		101	103	103	104	106	98.9	98	102
Stm. AH 2-2 Air Outlet		106	109	109	110	111	87.5	89	89
AH 2-1 Air Inlet		109	111	110	112	112	97	98	99
AH 2-2 Air Inlet		110	113	113	114	115	87	87	88
AH 2-1 Air Outlet		495	491	497	497	496	496	449	495
AH 2-2 Air Outlet		520	519	524	525	523	523	526	518
AH 2-1 Gas Inlet		630	625	638	644	638	641	656	624
AH 2-2 Gas Inlet		655	662	672	671	664	674	683	656
AH 2-1 Gas Outlet		256	252	259	257	256	258	260	253
AH 2-2 Gas Outlet		283	281	286	284	284	276	277	272
Steam & Water, Degrees F									
Feedwater to Economizer		484	484	484	484	484	483	484	484
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		661	660	660	661	662	652	653	653
Desuperheater Inlet L		737	737	744	743	739	741	748	734
Desuperheater Inlet R		740	737	744	742	739	747	756	737
Desuperheater Outlet L		738	737	744	742	739	745	742	734
Desuperheater Outlet R		734	736	742	743	738	740	744	731
Throttle Steam		1007	1005	1016	1008	1005	1003	1008	998
Reheat-Cold at Turbine		636	632	644	637	635	632	637	628
Reheat Atemp Inlet L		637	631	644	637	635	632	633	628
Reheat Atemp Inlet R		632	627	639	632	631	628	630	623
Reheat Boiler Outlet		1009	1000	1018	1009	1009	998	1006	999
HP EXTR Steam Inlet		635	630	643	635	634	631	636	627
HP FW Heater Inlet		409	408	409	409	409	409	409	409
HP FW Heater Drain		420	419	420	420	420	419	420	420
Auxiliary Steam		612	604	621	613	610	617	621	605
Miscellaneous									
Burner Tilt LR ± Deg		5.5	18	+3	-3	-9	+4	-1.5	+0.3
Burner Tilt LF ± Deg		5.3	18	+3	-3	-8	+4	-1.5	0
Burner Tilt RF ± Deg		6.2	18	+4	-2	-8	+4	-0.4	+1.4
Burner Tilt RR ± Deg		5.6	18	+3	-3	-9	+4	-1.6	-0.3
Flue Gas Oxygen R		2.93	2.6	4.2	4.3	3.1	3.49	4.12	1.42
Flue Gas Oxygen L		2.68	2.7	3.6	3.4	2.8	4.26	5.46	2.08
Flue Gas Oxygen Avg.		2.80	2.6	3.9	3.8	2.9	3.87	4.81	1.73
Drum Level "H_2O		1.25	0.9	1.03	1.12	1.0	0	-0.13	0
FD Fan 2-1 Amps		118	116	120	119	115	125	133	116
FD Fan 2-2 Amps		121	118	125	124	118	126	135	116
ID Fan 2-1 Amps		258	260	263	261	256	264	276	254
ID Fan 2-2 Amps		262	261	267	266	261	273	287	259

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		25	26	27	28	29	30	31	32
Test Date	1981	8/10	8/11	8/11	8/11	8/11	8/11	8/11	8/11
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		63	56.2	61	68	60	61	62	62
FD 2-1 Fan Outlet		78	71	74	74	75	77	78	78
FD 2-2 Fan Outlet		79	73	73	73	76	78	79	79
Stm. AH 2-1 Air Outlet		86	87	90	91	86	103	103	105
Stm. AH 2-2 Air Outlet		497	495	492	491	491	86	88	88
AH 2-1 Air Inlet		521	519	521	521	518	104	104	106
AH 2-2 Air Inlet		103	100	102	102	105	84	87	88
AH 2-1 Air Outlet		88	88	88	88	87	492	490	489
AH 2-2 Air Outlet		100	99	101	103	104	524	520	520
AH 2-1 Gas Inlet		635	644	650	649	632	655	645	644
AH 2-2 Gas Inlet		660	655	678	676	658	683	672	673
AH 2-1 Gas Outlet		254	256	253	252	250	253	252	250
AH 2-2 Gas Outlet		273	274	273	274	274	276	275	275
Steam & Water, Degrees F									
Feedwater to Economizer		486	484	484	484	484	485	483	484
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		652	652	650	651	649	649	649	649
Desuperheater Inlet L		738	740	742	740	732	744	735	738
Desuperheater Inlet R		743	746	746	742	735	749	740	740
Desuperheater Outlet L		723	744	745	741	734	739	739	738
Desuperheater Outlet R		729	739	741	739	731	743	733	735
Throttle Steam		1007	1001	1007	994	1000	1014	984	987
Reheat-Cold at Turbine		639	631	634	625	631	643	616	618
Reheat Atemp Inlet L		598	632	634	625	631	639	615	618
Reheat Atemp Inlet R		604	627	629	620	627	635	610	613
Reheat Boiler Outlet		1004	997	998	985	1005	1015	968	977
HP EXTR Steam Inlet		640	630	633	624	631	642	615	617
HP FW Heater Inlet		411	409	409	409	409	409	408	409
HP FW Heater Drain		422	419	419	420	420	420	419	419
Auxiliary Steam		607	616	614	607	608	623	593	597
Miscellaneous									
Burner Tilt LR ± Deg		0	-0.6	0	0	0	0	1	1
Burner Tilt LF ± Deg		0	-0.5	0	0	0	0	1	1
Burner Tilt RF ± Deg		+1.3	+0.6	0	0	0	1	1	2
Burner Tilt RR ± Deg		-0.5	-1.2	-1	-1	-1	-1	0	0
Flue Gas Oxygen R		2.58	3.02	3.5	4.0	2.05	3.74	3.5	4.04
Flue Gas Oxygen L		1.60	4.43	4.1	4.0	1.79	3.92	3.9	3.61
Flue Gas Oxygen Avg.		2.12	3.74	3.8	3.99	1.92	3.83	3.7	3.85
Drum Level "H_2O		0.22	0.29	0.1	-0.1	0.2	-0.3	-0.1	0.0
FD Fan 2-1 Amps		115	129	127	127	116	127	125	125
FD Fan 2-2 Amps		117	129	130	129	117	128	126	127
ID Fan 2-1 Amps		253	268	267	266	253	265	263	262
ID Fan 2-2 Amps		258	278	276	280	259	278	275	274

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		33	34	35	36	37	38	39	40
Test Date	1981	8/12	8/12	8/12	8/12	8/12	8/12	8/12	8/13
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		63	68	69	71	68	68	66	61
FD 2-1 Fan Outlet		78	78	81	82	83	84	83	75
FD 2-2 Fan Outlet		77	78	79	81	82	84	82	75
Stm. AH 2-1 Air Outlet		92	93	93	97	97	96	93	93
Stm. AH 2-2 Air Outlet		95	94	95	94	96	93	92	94
AH 2-1 Air Inlet		93	94	96	100	100	100	98	92
AH 2-2 Air Inlet		96	96	97	97	99	95	90	94
AH 2-1 Air Outlet		504	503	503	499	502	504	501	500
AH 2-2 Air Outlet		523	522	520	515	518	523	525	522
AH 2-1 Gas Inlet		665	646	645	629	633	625	632	659
AH 2-2 Gas Inlet		676	671	677	659	667	679	690	677
AH 2-1 Gas Outlet		264	264	262	259	259	262	262	263
AH 2-2 Gas Outlet		269	268	266	266	267	268	270	270
Steam & Water, Degrees F									
Feedwater to Economizer		490	489	489	488	489	490	489	489
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		653	652	655	653	654	654	657	652
Desuperheater Inlet L		747	742	739	728	735	741	745	745
Desuperheater Inlet R		751	747	742	729	738	746	743	743
Desuperheater Outlet L		728	739	739	728	736	745	742	740
Desuperheater Outlet R		735	740	738	726	733	740	741	743
Throttle Steam		1011	1004	998	979	1002	1014	1000	1005
Reheat-Cold at Turbine		651	642	638	620	640	653	639	643
Reheat Atemp Inlet L		631	643	639	619	640	625	639	643
Reheat Atemp Inlet R		632	638	635	615	636	626	634	639
Reheat Boiler Outlet		1022	1018	1008	979	1018	1024	1008	1014
HP EXTR Steam Inlet		650	641	637	619	640	652	638	642
HP FW Heater Inlet		415	414	414	413	413	414	413	413
HP FW Heater Drain		426	425	425	424	425	425	424	425
Auxiliary Steam		614	610	609	580	605	622	606	610
Miscellaneous									
Burner Tilt LR ± Deg		18	0	-11	-11	-1	-1	-1	-0.7
Burner Tilt LF ± Deg		18	0	-10	-10	-1	-1	-1	-0.6
Burner Tilt RF ± Deg		18	0	-9	-10	0	0	0	+0.6
Burner Tilt RR ± Deg		18	0	-11	-11	-1	-1	-1.4	-1.0
Flue Gas Oxygen R		2.7	3.06	2.96	2.9	1.89	1.9	4.18	4.74
Flue Gas Oxygen L		4.9	4.64	4.4	2.1	2.12	3.4	3.16	2.92
Flue Gas Oxygen Avg.		3.8	3.84	3.7	2.5	2.04	2.6	3.65	3.86
Drum Level "H_2O		0.4	0.1	0.1	0.2	0.21	0.2	-0.1	-0.4
FD Fan 2-1 Amps		134	131	130	117	119	124	129	131
FD Fan 2-2 Amps		142	137	136	121	122	128	134	138
ID Fan 2-1 Amps		284	279	277	259	259	268	276	279
ID Fan 2-2 Amps		283	281	277	259	260	267	276	279

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		41	42	43	44	45	46	47	48
Test Date	1981	8/13	8/13	8/13	8/13	8/13	8/14	8/14	8/14
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		66	66	67	64	63	71	71	76
FD 2-1 Fan Outlet		77	79	84	83	79	82	84	88
FD 2-2 Fan Outlet		78	82	83	83	81	82	84	86
Stm. AH 2-1 Air Outlet		96	96	94	94	93	98	97	100
Stm. AH 2-2 Air Outlet		90	93	94	94	93	96	98	100
AH 2-1 Air Inlet		95	98	98	98	96	98	99	107
AH 2-2 Air Inlet		89	93	93	94	93	94	96	99
AH 2-1 Air Outlet		501	501	505	504	502	491	491	491
AH 2-2 Air Outlet		520	520	526	527	526	515	516	513
AH 2-1 Gas Inlet		652	646	666	667	662	659	661	650
AH 2-2 Gas Inlet		669	657	679	682	677	661	661	645
AH 2-1 Gas Outlet		263	258	262	262	260	259	259	256
AH 2-2 Gas Outlet		267	268	267	269	269	266	266	265
Steam & Water, Degrees F									
Feedwater to Economizer		489	490	490	490	490	483	484	484
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		652	655	654	655	655	655	655	656
Desuperheater Inlet L		741	735	744	748	748	742	742	738
Desuperheater Inlet R		743	737	746	747	746	742	741	636
Desuperheater Outlet L		741	731	738	735	736	743	742	737
Desuperheater Outlet R		740	734	744	741	743	742	741	737
Throttle Steam		1016	1007	1005	1009	1009	1000	1000	999
Reheat-Cold at Turbine		652	647	645	649	648	629	629	628
Reheat Atemp Inlet L		651	621	610	621	621	629	630	629
Reheat Atemp Inlet R		647	623	614	623	623	625	626	624
Reheat Boiler Outlet		1027	1015	1001	1012	1009	979	980	981
HP EXTR Steam Inlet		650	646	644	647	647	628	629	627
HP FW Heater Inlet		413	415	414	415	414	409	408	409
HP FW Heater Drain		424	426	425	426	425	420	419	419
Auxiliary Steam		623	608	614	611	614	613	618	612
Miscellaneous									
Burner Tilt LR ± Deg		-0.7	-0.6	-0.6	0	0	+1	+1	+1
Burner Tilt LF ± Deg		-0.6	-0.6	-0.6	0	0	+1	+1	+1
Burner Tilt RF ± Deg		+0.6	+0.5	+0.6	0	0	+2	+2	+2
Burner Tilt RR ± Deg		-1.0	-1.0	-1.0	0	0	+1	+1	+1
Flue Gas Oxygen R		1.94	2.11	3.85	3.98	4.15	4.96	5.32	4.03
Flue Gas Oxygen L		3.40	1.65	3.79	3.61	3.43	4.79	4.74	3.54
Flue Gas Oxygen Avg.		2.66	1.88	3.86	3.79	3.79	4.87	5.00	3.82
Drum Level "H_2O		0	0.1	0.14	0.02	0.06	0.04	0.05	0.11
FD Fan 2-1 Amps		124	111	129	129	129	136	134	124
FD Fan 2-2 Amps		128	121	135	134	135	142	140	129
ID Fan 2-1 Amps		267	258	275	274	274	281	281	266
ID Fan 2-2 Amps		267	259	274	276	275	282	280	267

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		49	50	51	52	53	54	55	56
Test Date	1981	8/14	8/14	8/14	8/17	8/17	8/17	8/17	8/17
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		78	77	78	65	67	65	67	64
FD 2-1 Fan Outlet		88	90	90	79	79	79	79	76
FD 2-2 Fan Outlet		87	90	89	69	69	69	77	74
Stm. AH 2-1 Air Outlet		100	100	99	107	106	107	108	109
Stm. AH 2-2 Air Outlet		100	98	97	105	105	107	106	106
AH 2-1 Air Inlet		104	105	105	105	104	108	107	108
AH 2-2 Air Inlet		97	99	97	104	103	105	102	102
AH 2-1 Air Outlet		494	496	496	473	471	471	470	469
AH 2-2 Air Outlet		511	512	516	485	480	485	483	482
AH 2-1 Gas Inlet		645	650	648	587	572	586	581	582
AH 2-2 Gas Inlet		636	640	649	611	595	606	601	601
AH 2-1 Gas Outlet		257	259	259	249	249	248	247	247
AH 2-2 Gas Outlet		263	264	268	254	255	256	255	255
Steam & Water, Degrees F									
Feedwater to Economizer		483	483	484	458	456	456	456	455
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		657	656	656	649	649	648	648	648
Desuperheater Inlet L		735	740	747	747	734	744	737	736
Desuperheater Inlet R		740	742	747	748	727	744	740	732
Desuperheater Outlet L		740	742	744	725	724	742	738	731
Desuperheater Outlet R		734	739	745	732	730	743	735	734
Throttle Steam		1001	1012	1016	1008	996	1016	1001	985
Reheat-Cold at Turbine		631	640	644	598	586	604	591	579
Reheat Atemp Inlet L		631	640	644	598	586	604	592	579
Reheat Atemp Inlet R		626	635	640	594	582	599	588	575
Reheat Boiler Outlet		986	1003	1017	978	947	973	953	939
HP EXTR Steam Inlet		630	639	643	597	585	603	591	578
HP FW Heater Inlet		409	409	410	388	386	386	386	386
HP FW Heater Drain		419	419	420	395	394	393	393	394
Auxiliary Steam		613	620	624	624	616	643	630	612
Miscellaneous									
Burner Tilt LR ± Deg		+1	+1	+1	+15	+10	+10	+10	+10
Burner Tilt LF ± Deg		+1	+1	+1	+15	+10	+10	+10	+10
Burner Tilt RF ± Deg		+2	+2	+2	+15	+10	+10	+10	+10
Burner Tilt RR ± Deg		+1	+1	+1	+15	+10	+10	+10	+10
Flue Gas Oxygen R		3.81	4.05	4.88	3.75	3.08	5.33	5.06	6.01
Flue Gas Oxygen L		3.89	3.78	2.54	5.13	3.57	5.59	5.77	4.87
Flue Gas Oxygen Avg.		3.83	3.91	3.73	4.40	3.37	5.45	5.35	5.43
Drum Level	"H_2O	0.2	0.04	-0.08	0.21	0.22	-0.25	0.2	-0.08
FD Fan 2-1	Amps	122	123	126	115	110	117	115	115
FD Fan 2-2	Amps	126	126	129	119	113	121	118	118
ID Fan 2-1	Amps	265	264	267	252	245	254	251	253
ID Fan 2-2	Amps	264	264	270	252	248	253	252	252

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		57	58	59	60	61	62	63	64
Test Date	1981	8/17	8/17	8/17	8/18	8/18	8/18	8/18	8/18
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		62	57	69	69	65	63	64	63
FD 2-1 Fan Outlet		77	73	84	81	80	76	76	73
FD 2-2 Fan Outlet		76	74	84	79	79	75	74	73
Stm. AH 2-1 Air Outlet		108	108	100	105	105	108	105	107
Stm. AH 2-2 Air Outlet		106	106	99	106	111	106	102	105
AH 2-1 Air Inlet		105	107	104	105	104	105	102	105
AH 2-2 Air Inlet		103	102	101	107	115	103	101	101
AH 2-1 Air Outlet		471	469	486	480	478	475	474	474
AH 2-2 Air Outlet		481	479	492	487	483	487	486	483
AH 2-1 Gas Inlet		576	573	586	588	577	489	586	578
AH 2-2 Gas Inlet		594	593	598	602	591	604	602	594
AH 2-1 Gas Outlet		247	246	255	250	249	248	250	247
AH 2-2 Gas Outlet		254	254	260	254	256	255	259	256
Steam & Water, Degrees F									
Feedwater to Economizer		455	455	456	456	456	455	454	454
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		647	648	649	649	648	647	646	647
Desuperheater Inlet L		732	731	749	752	743	754	748	742
Desuperheater Inlet R		731	729	754	757	753	759	746	742
Desuperheater Outlet L		730	725	725	718	712	718	725	721
Desuperheater Outlet R		732	729	732	726	720	725	732	728
Throttle Steam		987	974	1008	1006	1014	1007	1001	1002
Reheat-Cold at Turbine		588	568	596	595	601	597	589	590
Reheat Atemp Inlet L		581	569	597	596	601	596	589	590
Reheat Atemp Inlet R		577	565	592	591	596	591	585	586
Reheat Boiler Outlet		942	923	990	999	1001	990	970	972
HP EXTR Steam Inlet		580	568	595	595	599	594	588	589
HP FW Heater Inlet		386	386	387	387	387	387	385	386
HP FW Heater Drain		383	393	393	394	393	393	392	392
Auxiliary Steam		609	596	618	603	606	606	611	611
Miscellaneous									
Burner Tilt LR ± Deg		+10	+10	-1	-1	-1	-1	-1	-1
Burner Tilt LF ± Deg		+10	+10	-1	-1	-1	-1	-1	-1
Burner Tilt RF ± Deg		+10	+10	0	0	0	0	0	0
Burner Tilt RR ± Deg		+10	+10	-2	-2	-2	-2	-2	-2
Flue Gas Oxygen R		5.01	4.90	4.05	4.65	3.73	5.83	6.08	5.03
Flue Gas Oxygen L		3.91	3.70	4.60	3.89	2.95	4.93	4.88	3.90
Flue Gas Oxygen Avg.		4.43	4.26	4.33	4.23	3.34	5.43	5.46	4.46
Drum Level "H_2O		0.06	0.03	-0.01	0.34	0.16	-0.04	-0.35	-0.1
FD Fan 2-1 Amps		111	112	108	114	110	117	115	112
FD Fan 2-2 Amps		114	115	110	118	112	121	119	114
ID Fan 2-1 Amps		248	247	247	247	242	252	248	246
ID Fan 2-2 Amps		248	249	248	249	245	252	249	248

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		101	102	103	104	105	106	107	108
Date	1981	10/29	10/29	10/30	10/30	10/30	10/30	11/2	11/2
FLOWS, 10E3 LB/HR									
Air Flow		31381	3010	3196	3080	3126	3040	2945	2375
Feedwater		2864	2736	2741	2408	2727	2815	2765	2182
Main Steam		2796	2692	2730	2730	2730	2759	2733	2220
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		28.4	28.2	29	29	29	29	31	30
Stm. AH Extr.		17.7	17.8	30	26	26.9	27	27	19.4
Stm. AH Aux.		NA	NA	NA	NA	NA	NA	NA	NA
Condensate Flow		2450	2157	2306	2329	2301	2469	2250	1865
Superheat Spray L		0	0	43	60.7	54	25.6	29	38.7
Superheat Spray R		0	0	27	43	45	16.7	20	33.0
Reheat Spray		0.0	0	0.0	0.0	0.0	0	0	0
PRESSURES									
Steam & Water, Psig									
Boiler Drum		2267	2646	2641	2657	2640	2662	2651	2554
Throttle Steam		2416	2399	2397	2395	2397	2415	2403	2390
Turbine 1st Stage		1689	1669	1687	1686	1688	1698	1689	1345
Turbine Cold Reheat		548	540	549	551	551	551	548	440
Reheat Inlet		505	497	507	508	508	508	506	407
Extr. Steam (HP-FW)		541	534	544	546	546	545	540	434
Main Steam		2443	2420	2425	2423	2423	2434	2429	2405
Aux. Steam		337	338	334	335	335	335	333	334
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		10	8	9	9	9.5	10	10	8.0
FD Fan 2-2 Discharge		10	8	9	9	9.5	10	10	8.5
AH 2-1 Air Diff.		2.2	2.4	2.6	2.4	2.5	2.5	2.23	1.43
AH 2-2 Air Diff.		2.6	2.74	2.9	2.8	2.9	2.8	3.07	2.38
Windbox Pressure L		5	3.2	3.5	4.0	4.5	5	5	5
Windbox Pressure R		5	3.2	3.5	4.0	4.5	5	5	5
WB/Furn. Diff. L		5.5	3.7	4.0	4.5	6.0	5.5	5.5	5.75
WB/Furn. Diff. R		5.5	3.7	4.0	4.5	6.0	5.5	5.5	5.75
Furnace Draft		-0.3	-.61	-.29	-.79	-.40	-0.58	-.32	-.32
SH Draft Diff.		1.6	1.67	1.87	1.71	1.81	1.79	1.74	1.08
Econ. Draft Diff.		2.6	2.63	2.92	2.75	2.8	2.76	2.6	1.80
AH 2-1 Gas Diff.		10	10	11.0	10.7	10.5	10.5	10	7.5
AH 2-2 Gas Diff.		12.5	11.5	12.5	12.0	12.0	12.5	11.5	8.5
ID Fan 2-1 Inlet		-11.4	-13.4	-13.3	-13.0	-12.8	-12.5	-11.9	-8.43
ID Fan 2-2 Inlet		-13.4	-14.1	-14.9	-14.0	-14.0	-14.0	-13.5	-10.04
Atm. Barometric "Hg		24.37	24.38	24.7	24.8	24.3	24.8	25.0	25.0

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		109	110	111	112	113	114	115	116
Date	1981	11/2	11/2	11/2	11/2	11/3	11/3	11/3	11/3
FLOWS, 10E3 LB/HR									
Air Flow		2361	2260	2961	2939	2768	2936	3415	3273
Feedwater		2121	2133	2699	2751	2694	2832	2772	2757
Main Steam		2211	2217	2744	2727	2730	2449	2714	1696
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		30	29	28	31	30	29	28	28
Stm. AH Extr.		18.7	11.0	5.73	8.8	15	9	11	12
Stm. AH Aux.		NA	NA	86			86	86	86
Condensate Flow		1894	1846	2335	2283	2265	2262	2195	2301
Superheat Spray L		56	50	62	24.0	47	0.0	0.0	0
Superheat Spray R		53	46	59	19.9	45	0.0	0.0	0
Reheat Spray		0	0	0.0	0.0	17.5	0.0	0.0	0
PRESSURES Steam & Water, Psig									
Boiler Drum		2551	2560	2650	2647	2641	2649	2645	2637
Throttle Steam		2388	2395	2405	2400	2398	2397	2394	2387
Turbine 1st Stage		1343	1345	1691	1687	1686	1683	1680	1675
Turbine Cold Reheat		442	441	552	548	552	544	541	539
Reheat Inlet		408	408	509	505	509	501	499	497
Extr. Steam (HP-FW)		436	436	543	543	547	538	535	533
Main Steam		2405	2411	2432	2425	2423	2421	2417	2412
Aux. Steam		334	335	337	334	335	338	338	338
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		6.0	6.0	8.0	7.5	7.0	8.5	11.5	10.5
FD Fan 2-2 Discharge		6.0	6.0	8.0	7.5	7.5	8.5	11.5	11.0
AH 2-1 Air Diff.		1.5	1.4	2.2	2.2	2.0	2.24	2.93	2.74
AH 2-2 Air Diff.		2.19	2.1	2.9	3.8	2.7	2.81	3.59	3.55
Windbox Pressure L		2.5	3.0	3.0	3.0	3.0	3.5	5.5	5.0
Windbox Pressure R		2.5	3.0	3.0	3.0	3.0	3.5	5.5	5.0
WB/Furn. Diff. L		3.0	3.5	3.5	3.5	3.5	4.0	6.0	5.5
WB/Furn. Diff. R		3.0	3.5	3.5	3.5	3.5	4.0	6.0	5.5
Furnace Draft		-.44	-.6	-0.44	-0.6	-0.53	-0.43	-0.54	-0.46
SH Draft Diff.		1.14	1.0	1.6	1.6	1.48	1.72	2.3	2.1
Econ. Draft Diff.		80	1.7	2.6	2.6	2.4	2.59	3.21	3.09
AH 2-1 Gas Diff.		7.0	9.5	10	10	9.0	10.0	11.5	11.5
AH 2-2 Gas Diff.		8.5	9.5	11.5	12	11.5	11.5	13.0	13.0
ID Fan 2-1 Inlet		-8.3	-7.6	-11.75	-11.5	-10.9	-11.8	-14.9	-14.21
ID Fan 2-2 Inlet		-10.0	-9.4	-13.68	-13.5	-12.8	-13.5	-16.6	-15.8
Atm. Barometric "Hg		24.97	24.98	24.9	24.8	24.8	24.7	24.7	24.7

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		117	118	119	120	121	122	123	124
Date	1981	11/03	11/4	11/4	11/4	11/4	11/4	11/4	11/4
FLOWS, 10E3 LB/HR									
Air Flow		3008	2972	2974	2997	2956	3042	3036	2928
Feedwater		2857	2792	2776	2759	2862	2877	2823	2772
Main Steam		2788	2781	2732	2735	2778	2792	2760	2721
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		28	30	30	29.8	29.5	29	29	30.0
Stm. AH Extr.		0.0	23	21	18.8	15.0	13	14.3	13.7
Stm. AH Aux.		86	NA	NA	NA	NA	NA	88.2	NA
Condensate Flow		2426	61	2269	2280	2325	2314	2291	2230
Superheat Spray L		0.0	0.0	20.2	15.7	0.0	0.0	0.0	0.0
Superheat Spray R		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reheat Spray		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PRESSURES									
Steam & Water, Psig									
Boiler Drum		2656	2655	2651	2651	2660	2661	2654	2651
Throttle Steam		2404	2464	2402	2400	2410	2407	2408	2398
Turbine 1st Stage		1692	1690	1691	1689	1696	1695	1688	1685
Turbine Cold Reheat		552	546	547	546	548	548	546	543
Reheat Inlet		509	503	504	503	505	505	502	501
Extr. Steam (HP-FW)		546	540	542	541	542	542	539	538
Main Steam		2425	2430	2428	2426	2431	2432	2424	2422
Aux. Steam		338	333	332	337	336	323	333	325
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		9.0	10.0	9.5	10.0	7.5	8.5	7.5	10.0
FD Fan 2-2 Discharge		9.0	10.0	10.0	10.0	7.5	8.5	7.5	10.0
AH 2-1 Air Diff.		2.4	2.4	2.3	2.3	2.26	2.3	2.42	2.31
AH 2-2 Air Diff.		3.0	3.1	3.1	3.2	3.04	3.0	3.16	3.23
Windbox Pressure L		5.0	5.0	5.0	5.0	3.0	3.5	3.3	4.5
Windbox Pressure R		5.0	5.2	5.0	5.0	3.0	3.5	3.3	5.0
WB/Furn. Diff. L		5.5	5.5	5.5	5.5	3.5	4.0	4.0	5.5
WB/Furn. Diff. R		5.5	5.5	5.0	5.5	3.5	4.0	4.3	5.7
Furnace Draft		-0.47	-0.41	-0.34	-0.26	-0.52	-0.21	-0.47	-0.3
SH Draft Diff.		1.8	1.72	1.1	1.7	1.74	1.07	1.79	1.8
Econ. Draft Diff.		2.7	2.59	2.6	2.6	2.59	2.53	2.70	2.7
AH 2-1 Gas Diff.		10.0	10.0	9.5	9.8	9.5	9.3	10.5	10.1
AH 2-2 Gas Diff.		12.0	11.5	11.0	11.5	11.0	11.0	12.0	11.0
ID Fan 2-1 Inlet		-12.0	-12.1	-11.9	-11.8	-12.0	-11.5	-12.1	-12.0
ID Fan 2-2 Inlet		-13.9	-13.6	-13.6	-13.7	-13.7	-13.4	-13.9	-13.8
Atm. Barometric "Hg		24.7	24.8	24.8	24.8	24.7	24.7	24.7	24.7

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		125	126	127	128	129	130	131	132
Date	1981	11/5	11/5	11/5	11/5	11/6	11/6	11/6	11/6
FLOWS, 10E3 LB/HR									
Air Flow		3038	3240	3216	3366	3250	3280	3211	3079
Feedwater		2792	2982	2992	2999	2942	2983	2983	2996
Main Steam		2755	2883	2897	2922	2869	2877	2906	2918
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		30.4	30	29.6	28.6	29	29	29	29
Stm. AH Extr.		26.1	23.6	19.2	16.0	30.3	26.8	25	25
Stm. AH Aux.		NA	NA	NA	NA	NA	NA	NA	NA
Condensate Flow		2283	2354	2476	2416	2432	2368	2458	2431
Superheat Spray L		42	0.0	0.0	0.0	18.6	0.0	0	0
Superheat Spray R		37	0.0	0.0	0.0	0.0	0.0	0	0
Reheat Spray		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PRESSURES									
Steam & Water, Psig									
Boiler Drum		2647	2672	2670	2689	2679	2643	2685	2700
Throttle Steam		2400	2396	2376	2404	2405	2369	2401	2415
Turbine 1st Stage		1690	1774	1774	1816	1781	1755	1813	1826
Turbine Cold Reheat		550	572	574	586	576	566	584	591
Reheat Inlet		508	527	529	540	531	521	598	546
Extr. Steam (HP-FW)		546	566	568	579	563	560	577	585
Main Steam		242	2429	2427	2434	2435	2397	2433	2440
Aux. Steam		332	338	334	318	334	334	334	334
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		9.5	11.0	10.4	10.7	10.5	11.0	10.5	10.0
FD Fan 2-2 Discharge		9.5	11.0	10.5	10.7	10.5	11.0	10.3	10.0
AH 2-1 Air Diff.		2.5	2.85	2.74	2.9	2.7	3.03	2.6	2.34
AH 2-2 Air Diff.		3.2	3.52	3.97	3.6	3.5	3.71	3.5	3.11
Windbox Pressure L		5.0	6.0	4.5	5.0	5.0	5.0	5.0	5.0
Windbox Pressure R		5.0	6.0	4.5	5.0	5.0	5.0	5.0	5.0
WB/Furn. Diff. L		5.5	6.5	5.5	5.5	5.5	5.7	5.5	5.5
WB/Furn. Diff. R		5.7	6.5	5.7	5.5	5.5	5.8	5.5	5.5
Furnace Draft		-0.42	-0.51	-0.56	-0.69	-0.16	-.64	-0.5	-0.3
SH Draft Diff.		1.76	2.03	2.03	2.05	2.01	2.3	1.9	1.7
Econ. Draft Diff.		2.74	2.04	3.01	3.09	2.93	3.2	2.9	2.7
AH 2-1 Gas Diff.		10.3	12.0	11.7	11.6	11.0	12.0	11.0	10.5
AH 2-2 Gas Diff.		11.5	13.0	12.0	12.7	12.5	13.0	12.5	12.0
ID Fan 2-1 Inlet		-12.0	-14.0	-15.0	-15.0	-13.6	-15.0	-13	-12
ID Fan 2-2 Inlet		-14.24	-15.5	-15.6	-16.0	-15.3	-16.7	-15	-14
Atm. Barometric "Hg		24.8	24.8	24.8	24.8	24.9	24.9	24.9	24.9

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		133	134	135	136	137	138	139	140
Date	1981	11/6	11/6	11/9	11/9	11/9	11/9	11/9	11/9
FLOWS, 10E3 LB/HR									
Air Flow		NA	3606	3197	3216	3231	3226	3250	3235
Feedwater		NA	2990	3006	2934	2978	2997	3015	3016
Main Steam		NA	2885	2923	2883	2901	2907	2909	2914
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		NA	29	28.5	28.1	27.95	27.89	27.84	28
Stm. AH Extr.		NA	31	16.2	15.0	13.89	13.2	13.02	14
Stm. AH Aux.		NA	NA	NA	NA	NA	NA	NA	NA
Condensate Flow		NA	2408	2461	2432	2393	2425	2443	2488
Superheat Spray L		NA	0	24	40	26.16	15.48	0.0	0
Superheat Spray R		NA	0	0	17.92	0.0	0.0	0.0	0
Reheat Spray		NA	0	0	0	0.0	0.0	0.0	0
PRESSURES Steam & Water, Psig									
Boiler Drum		NA	2664	2673	2670	2684	2682	2684	2682
Throttle Steam		NA	2379	2396	2394	2407	2403	2402	2402
Turbine 1st Stage		NA	1798	1793	1793	1803	1801	1800	1299
Turbine Cold Reheat		NA	596	583	580	584	587	583	584
Reheat Inlet		NA	531	538	535	588	538	538	538
Extr. Steam (HP-FW)		NA	560	576	573	577	577	577	576
Main Steam		NA	2412	2422	2433	2436	2431	2432	2431
Aux. Steam		NA	334	334	334	334	335	334	335
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		15+	11.5	11.3	9.0	9.5	10.5	11.0	10.5
FD Fan 2-2 Discharge		15+	11.5	11.3	9.0	9.5	10.5	10.0	10.5
AH 2-1 Air Diff.		NA	3.3	2.76	2.74	2.77	2.81	2.7	2.7
AH 2-2 Air Diff.		NA	4.09	3.60	3.49	3.53	3.47	3.6	3.4
Windbox Pressure L		7.0	4.5	5.0	4.0	4.5	5.0	4.5	5.0
Windbox Pressure R		7.0	4.5	5.0	4.0	4.5	5.0	4.5	5.0
WB/Furn. Diff. L		7.5	5.0	5.5	4.4	5.0	5.5	5.5	5.5
WB/Furn. Diff. R		7.5	5.0	5.7	4.9	5.0	5.6	5.5	5.5
Furnace Draft		NA	-0.7	-.35	-.59	-6.5	-0.71	-0.6	-0.28
SH Draft Diff.		NA	2.5	2.19	2.13	2.12	2.11	2.1	2.1
Econ. Draft Diff.		NA	3.5	3.3	2.86	2.98	3.0	3.0	3.0
AH 2-1 Gas Diff.		15+	14.5	13.0	12.5	12.0	12.0	12.5	12.5
AH 2-2 Gas Diff.		15+	15.0	13.0	12.5	12.3	12.0	12.5	12.5
ID Fan 2-1 Inlet		NA	-17.0	-14.7	-15.03	-14.5	-14.90	-15.0	-15.0
ID Fan 2-2 Inlet		NA	-17.9	-14.7	-14.65	-14.4	-14.74	-14.8	-14.7
Atm. Barometric "Hg		NA	24.9	25.0	25.0	24.9	25.0	25.0	25.0

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		141	142	143	144	145	146	147	148
Date	1981	11/10	11/10	11/10	11/10	11/10	11/10	11/11	11/11
FLOWS, 10E3 LB/HR									
Air Flow		3292	3315	3347	3407	3268	3560	3104	3412
Feedwater		2987	3012	2978	3016	3032	3030	2723	3037
Main Steam		2879	2802	2884	2897	2901	2898	2725	2926
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		29	28.7	28.6	28.8	28	28	29.9	29.6
Stm. AH Extr.		8.75	6.5	6.2	18.9	16	16	30.77	2.60
Stm. AH Aux.		NA	NA	NA	NA	NA	NA	NA	NA
Condensate Flow		2369	2443	2390	2408	2475	2465	2261	2504
Superheat Spray L		0	0	0	0	0	0	35.38	0.0
Superheat Spray R		0	0	0	0	0	0	32.5	0.0
Reheat Spray		0	0	0	0	0	0	0	0.0
PRESSURES									
Steam & Water, Psig									
Boiler Drum		2686	2684	2684	2682	2683	2677	2651	2689
Throttle Steam		2406	2407	2406	2404	2403	2396	2408	2404
Turbine 1st Stage		1800	1799	1800	NA	1798	1793	1886	1815
Turbine Cold Reheat		581	583	582	NA	581	580	550	587
Reheat Inlet		536	537	536	NA	536	535	507	542
Extr. Steam (HP-FW)		575	574	575	NA	574	573	543	581
Main Steam		2438	2436	2436	NA	2432	2424	2432	2434
Aux. Steam		328	329	329	NA	334	333	331	332
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		11.0	11.0	11.5	11.0	11.0	12	10.0	11.0
FD Fan 2-2 Discharge		11.0	11.0	11.5	11.0	11.0	12	10.0	11.2
AH 2-1 Air Diff.		2.8	2.96	2.80	NA	2.72	3.3	2.6	3.3
AH 2-2 Air Diff.		3.6	3.72	3.73	NA	3.65	4.07	3.4	3.9
Windbox Pressure L		5.0	4.8	5.3	5.0	5.0	5.0	4.5	5.0
Windbox Pressure R		5.0	4.8	5.3	5.0	5.0	5.0	4.5	4.0
WB/Furn. Diff. L		5.4	5.3	5.8	5.7	5.5	5.5	5.6	5.6
WB/Furn. Diff. R		5.6	5.6	6.0	5.7	5.7	5.7	5.8	5.8
Furnace Draft		-0.37	-1.17	-0.41	NA	-.66	-0.82	-0.26	-.65
SH Draft Diff.		2.3	2.37	2.3	NA	2.14	2.6	1.86	2.4
Econ. Draft Diff.		3.1	3.25	3.1	NA	3.00	3.5	2.85	3.3
AH 2-1 Gas Diff.		12.0	12.5	12.5	13.0	12.5	13	10.5	3.3
AH 2-2 Gas Diff.		13.0	13.3	13.2	13.5	12.5	14.5	12.2	13.6
ID Fan 2-1 Inlet		-14.8	-15.6	-14.8	NA	-14.6	-16.4	-12.5	-16.75
ID Fan 2-2 Inlet		-15.5	-16.2	-15.5	NA	-15.2	-18.3	-14.8	-16.85
Atm. Barometric "Hg		25.0	25.0	24.9	NA	24.90	25.0	24.9	24.9

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		149	150	151	152	153	154	155	156
Date	1981	11/11	11/11	11/11	11/11	11/12	11/12	11/12	11/12
FLOWS, 10E3 LB/HR									
Air Flow		3474	3534	3345	3289	3210	3199	3210	3207
Feedwater		3020	2987	3064	3045	2955	2947	3010	2977
Main Steam		2919	2911	2939	2929	2915	2913	2915	2920
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		29.2	28.8	28.2	28.2	29.3	29.0	28.7	29
Stm. AH Extr.		20.3	22.5	15.4	14.8	22	19.7	20.1	19
Stm. AH Aux.		NA	NA	NA	NA	NA	NA	NA	NA
Condensate Flow		2451	2367	2435	2480	2483	2444	2450	2436
Superheat Spray L		0	0	0	0	30.5	42	16	24
Superheat Spray R		0	0	0	0	29.1	23	0	0
Reheat Spray		0	0	0	0	0.0	0.0	0	0
PRESSURES Steam & Water, Psig									
Boiler Drum		2690	2679	2691	2678	2680	2679	2673	2672
Throttle Steam		2407	2399	247	2393	2401	2401	2383	2394
Turbine 1st Stage		1816	1809	1817	1809	1813	1813	1809	1808
Turbine Cold Reheat		588	585	586	584	589	589	585	588
Reheat Inlet		543	540	540	539	544	543	540	542
Extr. Steam (HP-FW)		581	579	578	577	583	583	579	582
Main Steam		2434	2427	2435	2423	2431	2430	2421	2421
Aux. Steam		331	332	334	333	332	333	333	333
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		11.5	12.0	12.0	10.5	10.3	10.5	10.0	10.3
FD Fan 2-2 Discharge		11.5	12.0	12.0	10.5	10.5	10.5	10.0	10.5
AH 2-1 Air Diff.		3.1	3.2	2.7	2.89	2.7	2.7	8.96	2.7
AH 2-2 Air Diff.		3.9	4.2	3.7	3.6	3.4	3.4	3.51	3.5
Windbox Pressure L		5.0	5.0	5.0	5.0	4.5	5.0	5.0	5.0
Windbox Pressure R		5.0	5.0	5.0	5.0	4.5	5.0	5.0	5.0
WB/Furn. Diff. L		5.4	5.4	5.7	5.5	5.3	5.5	5.5	5.5
WB/Furn. Diff. R		5.6	5.6	6.0	5.7	5.5	5.5	5.5	5.5
Furnace Draft		-0.48	-.58	-0.3	-0.65	-.55	-0.35	-0.58	-0.6
SH Draft Diff.		2.34	2.6	2.36	2.2	2.6	2.0	2.07	2.0
Econ. Draft Diff.		3.3	3.5	3.2	3.1	2.96	2.9	2.9	3.0
AH 2-1 Gas Diff.		14.0	13.5	13.3	12.5	12.5	12.0	11.5	11.5
AH 2-2 Gas Diff.		14.0	13.5	13.5	12.5	12.5	12.0	12.0	12.0
ID Fan 2-1 Inlet		-15.1	-17.5	-15.7	-15.11	-14.5	-14.3	-14.2	-14.3
ID Fan 2-2 Inlet		-16.4	-17.4	-15.8	-15.2	-14.5	-14.4	-14.3	-14.6
Atm. Barometric "Hg		24.9	24.9	24.8	24.8	24.8	24.8	24.8	24.8

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		157	158	159	160	161	162	163	164
Date	1981	11/12	11/12	11/12	11/12	11/12	11/12	11/12	11/12
FLOWS, 10E3 LB/HR									
Air Flow		3179	3195	3106	3136	3339	3350	3221	2207
Feedwater		2860	3005	3113	3021	3994	2794	2983	2964
Main Steam		2913	2901	2926	2922	2902	2905	2905	2911
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		28.6	29	28.6	28.5	28.4	28.4	28.3	28.0
Stm. AH Extr.		18.2	16	15	16.4	18.4	16.6	16.15	16
Stm. AH Aux.		NA	NA	NA	NA	NA	NA	NA	NA
Condensate Flow		2419	2513	2474	2433	2443	2416	2406	2410
Superheat Spray L		16	16	0	32	0	0	0	15
Superheat Spray R		0	0	0	0	0	0	0	0
Reheat Spray		0	0	0	0	0	0	0	30
PRESSURES Steam & Water, Psig									
Boiler Drum		2680	2667	2682	2677	2670	2691	2681	2675
Throttle Steam		2400	2386	2400	2395	2387	2401	2399	2413
Turbine 1st Stage		1812	1803	1812	1809	1804	1817	1812	1823
Turbine Cold Reheat		588	583	587	586	582	587	587	586
Reheat Inlet		543	538	541	541	536	541	541	550
Extr. Steam (HP-FW)		502	577	580	580	575	580	580	589
Main Steam		2427	2415	2430	2424	2417	2436	2428	2443
Aux. Steam		333	333	332	329	334	333	334	334
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		10.5	10.5	10.2	10.5	11.0	10.5	10.5	10
FD Fan 2-2 Discharge		10.5	10.5	10.2	10.5	11.0	10.5	10.5	10
AH 2-1 Air Diff.		2.7	2.8	2.8	2.7	3.0	3.05	2.9	2.7
AH 2-2 Air Diff.		3.7	3.6	3.4	3.4	3.8	3.7	3.6	3.4
Windbox Pressure L		5.0	5.6	5.0	5.0	5.0	4.8	5.0	5.0
Windbox Pressure R		5.0	5.0	5.0	5.0	5.0	4.8	5.0	5.0
WB/Furn. Diff. L		5.5	5.5	5.5	5.5	5.8	5.4	5.5	5.5
WB/Furn. Diff. R		5.7	5.5	5.7	5.5	5.8	5.4	5.5	5.8
Furnace Draft		-0.5	-0.36	-0.56	-0.9	-0.5	-0.63	-0.46	-0.56
SH Draft Diff.		2.12	2.15	2.0	1.86	2.3	2.2	2.04	2.0
Econ. Draft Diff.		2.95	3.0	2.9	2.87	3.1	3.1	2.9	2.9
AH 2-1 Gas Diff.		7.5	11.5	11.5	11.5	13.0	12.7	12.5	11.5
AH 2-2 Gas Diff.		7.5	12.0	11.7	11.5	13.0	13.0	12.5	12.0
ID Fan 2-1 Inlet		-14.5	-14.5	-14.4	-13.98	-15.7	-15.3	-14.4	-14.2
ID Fan 2-2 Inlet		-14.5	-14.6	-14.4	-14.2	-15.5	-15.4	-14.7	-14.5
Atm. Barometric "Hg		24.7	24.7	24.7	24.7	24.7	24.7	24.7	24.7

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		167*	168	169	170	171	172	173	174
Test Date	1981	11/13	11/13	11/13	11/13	11/16	11/16	11/16	11/16
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		51	52	59	57	45	45.2	48	51
FD 2-1 Fan Outlet		67	67	68	67	54	56	58	60.5
FD 2-2 Fan Outlet		67	67	67	67	55	56	58	60
Stm. AH 2-1 Air Outlet		97	96	96	95	102	102	102	103
Stm. AH 2-2 Air Outlet		95	95	96	96	87	87	87	88
AH 2-1 Air Inlet		99	98	98	98	108	107	107	108
AH 2-2 Air Inlet		90	88	89	91	81	80	82	82
AH 2-1 Air Outlet		503	501	505	505	499	498	498	499
AH 2-2 Air Outlet		516	515	520	520	523	521	521	524
AH 2-1 Gas Inlet		610	609	614	615	623	624	631	633
AH 2-2 Gas Inlet		650	647	655	656	654	652	648	659
AH 2-1 Gas Outlet		263	265	264	264	257	257	257	256
AH 2-2 Gas Outlet		267	268	267	267	278	277	277	276
Steam & Water, Degrees F									
Feedwater to Economizer		487	487	488	488	487	487	486	487
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		646	647	646	647	643	643	643	644
Desuperheater Inlet L		728	726	733	732	729	729	726	733
Desuperheater Inlet R		738	736	743	740	736	739	735	743
Desuperheater Outlet L		738	736	743	740	729	729	735	731
Desuperheater Outlet R		729	726	734	733	730	729	726	733
Throttle Steam		997	990	1013	997	997	1000	984	1006
Reheat-Cold at Turbine		643	637	657	645	645	646	639	651
Reheat Atemp Inlet L		641	634	654	642	643	644	636	648
Reheat Atemp Inlet R		640	634	653	642	643	643	636	648
Reheat Boiler Outlet		990	979	1015	1001	992	988	974	1000
HP EXTR Steam Inlet		642	535	655	643	644	425	438	649
HP FW Heater Inlet		414	414	415	415	415	419	413	415
HP FW Heater Drain		441	440	445	444	424	425	424	425
Auxiliary Steam		462	461	468	468	499	499	439	498
Miscellaneous									
Burner Tilt LR ± Deg		+19	+19	16	6	12	19	19	19
Burner Tilt LF ± Deg		+19	+19	17	6	13	19	19	19
Burner Tilt RF ± Deg		+18	+18	16	6	12	18	18	18
Burner Tilt RR ± Deg		+20	+20	18	7	13	20	20	20
Flue Gas Oxygen R		3.3	3.4	3.1	3.4	3.6	3.3	3.6	3.6
Flue Gas Oxygen L		4.6	4.8	4.7	4.6	4.4	4.6	4.4	4.1
Flue Gas Oxygen Avg.		4.0	4.1	4.0	4.0	4.0	4.0	4.0	3.8
Drum Level "H_2O		1.03	1.35	0.83	1.05	.95	1.1	0.7	1.0
FD Fan 2-1 Amps		128	130	129	128	128	129	129	128
FD Fan 2-2 Amps		129	131	129	129	128	128	127	129
ID Fan 2-1 Amps		273	272	273	271	265	267	261	263
ID Fan 2-2 Amps		274	274	273	272	280	286	280	283

* Board & Computer Data for Tests 165 and 166 Lost

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		175	176	177	178	179	180	181	182
Date	1981	11/16	11/16	11/16	11/16	11/16	11/16	11/16	11/17
FLOWS, 10E3 LB/HR									
Air Flow		3106	3255	3218	3220	3205	3215	3173	3561
Feedwater		2961	2969	2991	2937	2962	3030	3025	2987
Main Steam		2915	2916	2930	2925	2913	2935	2937	2923
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		28	28	28	28	27.9	28	28	29
Stm. AH Extr.		13	16	12	15	10.7	13	10.3	30
Stm. AH Aux.		NA	NA	NA	NA	NA	NA	NA	NA
Condensate Flow		2440	2512	2425	2058	2417	2460	2371	2447
Superheat Spray L		37	23	29	38	20.0	0	0	21
Superheat Spray R		15	0	0	0	0	0	0	0
Reheat Spray		0	0	0	0	0	0	0	0
PRESSURES									
Steam & Water, Psig									
Boiler Drum		2677	2685	2688	2682	2675	2686	2686	2682
Throttle Steam		2400	2404	2408	2405	2396	2405	2404	2402
Turbine 1st Stage		1815	1817	1822	1819	1812	1819	1817	1816
Turbine Cold Reheat		588	585	588	589	587	587	587	586
Reheat Inlet		542	539	542	543	540	541	541	540
Extr. Steam (HP-FW)		582	579	572	583	580	581	581	581
Main Steam		2429	2433	2438	2434	2422	2433	2432	2431
Aux. Steam		334	334	335	335	336	335	335	331
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		10.0	10.5	10.5	10.5	10.0	10.5	10.5	11.5
FD Fan 2-2 Discharge		10.0	10.5	10.5	10.5	10.0	10.5	10.5	11.5
AH 2-1 Air Diff.		2.7	2.8	2.8	2.9	2.9	2.8	2.8	3.4
AH 2-2 Air Diff.		3.3	3.4	3.4	3.5	3.8	3.6	3.3	4.0
Windbox Pressure L		4.5	5.0	5.0	5.0	4.7	5.0	5.0	5.0
Windbox Pressure R		4.5	5.0	5.0	5.0	4.7	5.0	5.0	5.0
WB/Furn. Diff. L		5.3	5.5	5.5	5.5	5.5	5.5	5.5	5.5
WB/Furn. Diff. R		5.7	5.5	5.5	5.5	5.5	5.5	5.5	5.8
Furnace Draft		-0.8	-0.4	-0.3	-0.5	-0.57	-0.7	-0.5	-0.6
SH Draft Diff.		1.9	1.8	2.07	3.0	1.98	2.1	1.9	2.4
Econ. Draft Diff.		2.9	2.9	2.77	3.0	3.01	3.1	2.9	3.5
AH 2-1 Gas Diff.		11.5	11.5	12.0	11.5	11.6	11.0	11.5	13.5
AH 2-2 Gas Diff.		13.0	13.0	13.5	13.0	13.0	12.5	13.0	13.5
ID Fan 2-1 Inlet		-13.4	-13.5	-13.8	-14.0	-13.7	-14.3	-13.5	-16.6
ID Fan 2-2 Inlet		-15.4	-15.5	-15.9	-16.0	-15.7	-16.5	-15.5	-17.7
Atm. Barometric "Hg		24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.7

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		183	184	185	186	187
Date	1981	11/17	11/17	11/17	11/17	11/17
FLOWS, 10E3 LB/HR						
Air Flow		3622	3539	3498	3537	3286
Feedwater		3076	3032	3039	3017	3001
Main Steam		2963	2939	2915	2909	2913
Reheat Steam		NA	NA	NA	NA	NA
Auxiliary Steam		28.6	29	37	35	29
Stm. AH Extr.		25.2	25.6	22	19	20
Stm. AH Aux.		NA	NA	NA	NA	NA
Condensate Flow		2461	2413	2458	2443	2367
Superheat Spray L		0	0	0	0	0
Superheat Spray R		15	0	0	0	0
Reheat Spray		0	0	0	0	0
PRESSURES Steam & Water, Psig						
Boiler Drum		2674	2681	2664	2677	2674
Throttle Steam		2393	2397	2381	2394	2393
Turbine 1st Stage		1809	1811	1798	1809	1811
Turbine Cold Reheat		583	582	578	582	582
Reheat Inlet		538	537	533	537	535
Extr. Steam (HP-FW)		577	577	572	576	574
Main Steam		2421	2429	2409	2422	2414
Aux. Steam		332	332	324	326	327
Air & Gas, "H_2O						
FD Fan 2-1 Discharge		12.5	12.5	11.5	12.0	11.0
FD Fan 2-2 Discharge		12.5	12.5	11.5	12.0	11.0
AH 2-1 Air Diff.		3.42	3.37	3.4	3.4	3.0
AH 2-2 Air Diff.		4.15	3.98	3.9	3.9	3.5
Windbox Pressure L		6.0	5.5	5.0	5.0	5.0
Windbox Pressure R		6.0	5.5	5.0	5.0	5.0
WB/Furn. Diff. L		6.5	6.5	5.5	5.5	5.5
WB/Furn. Diff. R		6.5	6.5	5.5	5.8	5.5
Furnace Draft		-0.71	-0.44	-0.5	-0.3	-0.4
SH Draft Diff.		2.47	2.33	2.4	2.4	2.1
Econ. Draft Diff.		3.56	3.44	3.4	3.4	3.1
AH 2-1 Gas Diff.		13.5	14.0	13.0	13.2	11.5
AH 2-2 Gas Diff.		14.0	14.5	14.0	14.2	12.5
ID Fan 2-1 Inlet		-17.2	-16.6	-16.2	-15.7	-14.5
ID Fan 2-2 Inlet		-18.7	-17.6	-17.2	-16.8	-15.8
Atm. Barometric "Hg		24.6	24.7	24.6	24.6	24.6

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		101	102	103	104	105	106	107	108
Date	1981	10/29	10/29	10/30	10/30	10/30	10/30	11/2	11/2
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		65	65	64	64	66	66	62	56
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		65	65	64	63	65	64	64	58
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		73	73	71	71	75	74	76	67
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		73	73	71	71	75	74	72	64
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		0	0	17	30	27	12	10	20
SH Spray R		0	0	28	36	37	18	18	30
RH Spray		0	0	0	0	0	0	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		73	68	66	68.3	68.4	69	63.5	65
Coal Flow 2-2		74	68	67	69.0	68.2	66	64.3	64.7
Coal Flow 2-3		74	69	68	69.0	68.5	67	64.8	65.3
Coal Flow 2-4		74	69	68	69.0	68.4	66	64.7	0.0
Coal Flow 2-5		64	68	69	68.8	68.1	66	64.5	65.8
Coal Air Temp. 2-1, °F		164	163	163	162	163	163	164	162
Coal Air Temp. 2-2		163	161	163	111	162	160	163	163
Coal Air Temp. 2-3		165	164	165	164	165	164	165	164
Coal Air Temp. 2-4		163	162	162	162	162	162	162	NA
Coal Air Temp. 2-5		163	161	162	162	162	161	162	165
Mill 2-1	Amps	71	70	71	70.6	70.3	70.6	69	70.7
Mill 2-2		72	70	71	72	71.5	72.0	70	70.0
Mill 2-3		70	70.8	71	71	70.1	69.2	70	71.0
Mill 2-4		71	71	70	73	70.4	70.6	69	0.0
Mill 2-5		69	71.2	72	73	73.2	73.0	72	72.0
Exh. Discharge	"H_2O								
Mill 2-1		8	8	NA	8.0	8.5	8.5	8.0	8.0
Mill 2-2		8.5	8	8	8.0	8.5	8.5	8.0	8.5
Mill 2-3		7.5	7.5	7.5	8.0	8.0	7.5	7.5	8.0
Mill 2-4		8.0	8	8.0	8.0	8.0	7.5	7.5	0.0
Mill 2-5		7.0	7	7.0	8.0	8.0	6.5	6.5	6.5
Diff. Press. 2-1	"H_2O	7.5	8.5	8.5	8.5	8.3	8.5	9.0	8.0
Diff. Press. 2-2		6.0	5.8	6.0	6.0	6.0	6.0	5.5	5.5
Diff. Press. 2-3		7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Diff. Press. 2-4		7.5	7.5	7.3	7.2	7.5	7.5	7.0	0.0
Diff. Press. 2-5		7.5	7.5	7.5	7.5	7.5	3.0	7.5	7.5
Mill 2-1 Suction		-1	-1.2	-1.3	-1.9	-1.0	-1.0	-1.5	-1.5
Mill 2-2 Suction		-2.1	-2.4	-2.3	-2.3	-2.7	-2.3	-2.5	-2.5
Mill 2-3 Suction		-1.9	-2.0	-2.1	-2.0	-1.9	-2.0	-2.0	-2.0
Mill 2-4 Suction		-1.8	-1.7	-2.0	-2.0	-1.8	-2.0	-2.0	-1.5
Mill 2-5 Suction		-1.2	-1.6	-1.3	-2.0	-1.9	-1.7	-1.7	-1.7
Mill 2-1 Feeder Speed % Full		68	68	68	68	69	70	65	65
Mill 2-2 Feeder Speed		68	69	69	68	70	68	65	66
Mill 2-3 Feeder Speed		69	69	69	68	69	68	65	65
Mill 2-4 Feeder Speed		69	69	69	69	69	68	64	0.0
Mill 2-5 Feeder Speed		70	68	67	68	68	68	64	65

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		109	110	111	112	113	114	115	116
Date	1981	11/2	11/2	11/2	11/2	11/3	11/3	11/3	11/3
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		55	55	62	62	59	62	69	64
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		56	56	64	63	61	64	70	66
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		66	66	76	78	72	72	80	79
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		64	62	71	74	69	69	75	76
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		30	28	30	7	22	0	0	0
SH Spray R		40	38	40	18	33	0	0	0
RH Spray		0	0	0	0	28	0	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		66	67	66.9	66	67	67	67	68
Coal Flow 2-2		67	67	67	67	68	68	68	69
Coal Flow 2-3		67	68	68	67	69	67	68	69
Coal Flow 2-4		0.0	0.0	68	67	68	68	68	69
Coal Flow 2-5		67	67	67	67	59	62	63	64
Coal Air Temp. 2-1, °F		162	163	163	163	163	163	164	164
Coal Air Temp. 2-2		162	162	163	161	162	162	163	164
Coal Air Temp. 2-3		164	164	164	164	165	166	166	165
Coal Air Temp. 2-4		NA	NA	162	161	162	163	163	162
Coal Air Temp. 2-5		161	162	162	161	161	162	163	164
Mill 2-1	Amps	70.0	70	70	69	71	71	71	70
Mill 2-2		71	71	72	70	71	71	71	71
Mill 2-3		71	70	70	70	70	70	69	71
Mill 2-4		0.0	0.0	71	71	71	70	69	71
Mill 2-5		71	72	72.01	70	70	71	70	68
Exh. Discharge	"H_2O								
Mill 2-1		8.0	8.0	8.0	8.0	8.0	8.2	8.0	8.0
Mill 2-2		8.5	8.0	8.5	8.5	8.0	8.5	8.0	8.2
Mill 2-3		8.0	7.5	7.7	7.5	8.0	8.0	8.0	7.5
Mill 2-4		0.0	0.0	8.0	7.5	8.0	8.0	7.5	7.5
Mill 2-5		8.0	8.0	7.0	7.0	6.0	7.0	6.5	6.5
Diff. Press. 2-1	"H_2O	8.0	8.5	8.0	8.0	8.0	8.0	8.5	6.8
Diff. Press. 2-2		5.5	6.0	5.7	5.5	6.0	5.5	5.7	6.0
Diff. Press. 2-3		7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Diff. Press. 2-4		0.0	0.0	7.0	7.0	7.5	7.5	7.5	7.5
Diff. Press. 2-5		7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Mill 2-1 Suction		-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.4	-1.2
Mill 2-2 Suction		-2.3	-2.5	-2.3	-2.5	-2.3	-2.6	-2.3	-2.0
Mill 2-3 Suction		-2.2	-2.2	-2.2	-2.3	-2.2	-2.2	-2.0	-2.0
Mill 2-4 Suction		-1.3	-1.5	-1.9	-2.0	-2.0	-2.0	-1.8	-1.8
Mill 2-5 Suction		-1.9	-1.8	-1.8	-1.8	-2.0	-1.9	-1.8	-1.8
Mill 2-1 Feeder Speed % Full		66	68	67	67	68	66	64	68
Mill 2-2 Feeder Speed		66	68	67	68	68	66	66	68
Mill 2-3 Feeder Speed		66	68	66	66	68	66	66	68
Mill 2-4 Feeder Speed		0.0	0.0	66	67	63	65	66	68
Mill 2-5 Feeder Speed		66	66	66	67	58	60	62	64

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		117	118	119	120	121	122	123	124
Date	1981	11/3	11/4	11/4	11/4	11/4	11/4	11/4	11/4
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		64	62	62	64	62	63	62	64
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		66	64	65	66	64	66	66	66
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		76	74	72	79	76	76	78	76
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		72	69	69	76	72	72	74	71
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		0	0	9	0	0	0	0	0
SH Spray R		0	0	0	0	0	0	0	0
RH Spray		0	0	0	0	0	0	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		68	71	70	69	70	69	69	69
Coal Flow 2-2		69	71	71	70	70	69	70	70
Coal Flow 2-3		70	71	71	71	71	70	70	70
Coal Flow 2-4		69	71	71	71	70	70	70	70
Coal Flow 2-5		64	53	53	53	52	52	52	52
Coal Air Temp. 2-1, °F		163	164	164	164	164	164	164	164
Coal Air Temp. 2-2		163	164	164	164	163	163	164	163
Coal Air Temp. 2-3		165	164	163	164	164	164	164	164
Coal Air Temp. 2-4		162	164	164	163	164	163	164	164
Coal Air Temp. 2-5		162	164	164	164	164	163	164	164
Mill 2-1	Amps	70	72	71	71	70	71	72	72
Mill 2-2		71	72	73	72	72	72	71	72
Mill 2-3		71	71	69	71	72	69	71	71
Mill 2-4		71	73	70	72	71	70	71	73
Mill 2-5		68	0.0	72	69	70	66	68	69
Exh. Discharge	"H_2O								
Mill 2-1		8.1	8.0	8.5	8.5	8.0	8.0	8.0	8.5
Mill 2-2		8.0	8.0	8.5	8.5	8.0	8.0	8.4	8.5
Mill 2-3		8.0	7.5	7.5	7.5	8.0	7.7	7.5	7.5
Mill 2-4		7.7	8.0	8.0	8.0	8.0	8.0	8.0	7.5
Mill 2-5		7.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Diff. Press. 2-1	"H_2O	8.0	8.5	8.0	8.5	8.5	8.5	8.2	8.0
Diff. Press. 2-2		5.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Diff. Press. 2-3		7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Diff. Press. 2-4		7.5	7.5	7.0	7.0	7.5	7.5	7.5	7.5
Diff. Press. 2-5		7.5	7.5	7.2	7.2	7.0	7.0	7.0	7.6
Mill 2-1 Suction		-1.5	-1.3	-1.2	-1.2	-1.4	-1.4	-1.2	-1.2
Mill 2-2 Suction		-2.5	-0.2	-2.2	-2.4	-2.2	-2.2	-2.2	-2.1
Mill 2-3 Suction		-2.5	-2.0	-1.9	-2.0	-2.0	-2.0	-2.2	-1.9
Mill 2-4 Suction		-2.2	-1.8	-1.5	-2.2	-1.5	-1.8	-1.5	-1.5
Mill 2-5 Suction		-1.8	-2.0	-1.9	-2.0	-2.0	-1.9	-1.8	-1.8
Mill 2-1 Feeder Speed % Full		68	70	70	70	70	70	70	69
Mill 2-2 Feeder Speed		68	70	70	72	70	70	70	70
Mill 2-3 Feeder Speed		68	70	70	71	70	69	70	70
Mill 2-4 Feeder Speed		68	70	72	72	70	69	70	69
Mill 2-5 Feeder Speed		60	50	52	52	51	50	52	51

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		125	126	127	128	129	130	131	132
Date	1981	11/5	11/5	11/5	11/5	11/6	11/6	11/6	11/6
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		64	66	66	68	66	66	66	64
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		66	70	69	69	66	69	66	66
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		76	76	78	68	80	78	76	76
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		72	74	74	74	76	72	72	72
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		20	0	9	0	0	0	0	0
SH Spray R		30	0	0	0	0	0	0	0
RH Spray		0	0	0	0	0	0	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		66	70	68	71	72	74	71	71
Coal Flow 2-2		66	70	68	72	73	74	72	72
Coal Flow 2-3		67	71	70	73	73	75	73	73
Coal Flow 2-4		67	71	70	72	73	75	73	72
Coal Flow 2-5		67	70	70	63	64	62	68	67
Coal Air Temp. 2-1, °F		164	164	164	163	164	165	164	164
Coal Air Temp. 2-2		163	165	164	164	164	165	163	164
Coal Air Temp. 2-3		163	164	164	164	163	165	164	164
Coal Air Temp. 2-4		164	163	163	163	164	164	163	163
Coal Air Temp. 2-5		164	164	164	164	165	164	163	164
Mill 2-1	Amps	70.0	72	71	72	72	71	71	72
Mill 2-2		70.6	71	72	73	73	72	72	72
Mill 2-3		70.3	70	70	71	71	71	71	69
Mill 2-4		70.6	71	71	73	72	73	74	73
Mill 2-5		70.0	72	71	72	71	69	72	72
Exh. Discharge	"H_2O								
Mill 2-1		8.2	8.2	8.5	8.0	8.5	8.5	8.5	8.5
Mill 2-2		8.5	8.2	8.5	8.0	8.3	8.2	8.5	8.0
Mill 2-3		7.5	7.5	8.0	8.0	7.8	8.3	8.0	7.6
Mill 2-4		7.5	7.7	7.7	8.0	8.0	8.0	8.0	8.0
Mill 2-5		7.0	7.0	8.0	8.0	7.5	6.5	7.0	6.7
Diff. Press. 2-1	"H_2O	8.0	8.2	7.7	8.5	8.5	8.5	8.5	8.0
Diff. Press. 2-2		5.7	5.7	5.7	6.0	6.0	6.2	6.0	6.0
Diff. Press. 2-3		7.5	7.7	7.5	7.5	7.7	7.7	7.5	7.6
Diff. Press. 2-4		7.0	7.0	7.0	7.5	7.3	7.3	7.5	7.4
Diff. Press. 2-5		7.5	7.5	7.5	7.3	715	7.5	7.5	7.6
Mill 2-1 Suction		-1.2	-1.2	-1.2	-1.3	-1.3	-1.2	-1.3	-1.2
Mill 2-2 Suction		-2.2	-2.1	-2.4	-2.1	-2.1	-2.2	-2.0	-2.1
Mill 2-3 Suction		-2.0	-1.6	-2.0	-2.0	-1.9	-1.8	-1.8	-1.9
Mill 2-4 Suction		-1.8	-1.5	-1.8	-1.7	-1.5	-1.5	-1.5	-1.6
Mill 2-5 Suction		-1.5	-1.5	-1.7	-1.2	-1.3	-1.5	-1.5	-1.6
Mill 2-1 Feeder Speed % Full		68	70	68	70	71	72	72	72
Mill 2-2 Feeder Speed		68	70	69	72	70	72	72	73
Mill 2-3 Feeder Speed		68	72	69	70	70	71	72	71
Mill 2-4 Feeder Speed		68	70	69	70	72	72	72	73
Mill 2-5 Feeder Speed		68	70	68	62	62	60	70	66

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		133	134	135	136	137	138	139	140
Date	1981	11/6	11/6	11/9	11/9	11/9	11/9	11/9	11/9
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		76	70	69	64	66	66	66	66
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		78	70	70	66	67	68	68	68
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		84	82	80	78	78	78	82	78
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		80	87	75	73	72	74	76	74
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		0	0	24	14	18	10	0	0
SH Spray R		0	0	0	10	3	0	0	0
RH Spray		0	0	0	0	0	0	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		NA	73	68	69	69	68.5	68	67
Coal Flow 2-2		NA	73	69	70	69	69.2	69	68
Coal Flow 2-3		NA	74	70	70	70	70	69	68
Coal Flow 2-4		NA	74	70	70	70	70	68	68
Coal Flow 2-5		NA	69	70	70	69	69	68	68
Coal Air Temp. 2-1, °F		NA	163	164	164	164	163	164	164
Coal Air Temp. 2-2		NA	163	163	163	164	164	163	164
Coal Air Temp. 2-3		NA	163	163	163	163	163	164	164
Coal Air Temp. 2-4		NA	163	163	164	164	163	163	162
Coal Air Temp. 2-5		NA	161	163	163	165	163	164	163
Mill 2-1	Amps	NA	72	71.6	71.5	71	71	72	70
Mill 2-2		NA	71	71.6	72.0	72	72	72	70
Mill 2-3		NA	72	71.0	70.0	71	69	70	69
Mill 2-4		NA	74	71.8	70.0	71	71	73	72
Mill 2-5		NA	73	72.3	72.0	75	72	73	74
Exh. Discharge	"H_2O								
Mill 2-1		NA	8.5	8.5	8.5	8.5	8.3	8.5	8.0
Mill 2-2		NA	8.0	8.2	8.2	8.2	8.2	8.5	8.0
Mill 2-3		NA	8.5	7.6	7.5	7.5	7.7	8.5	7.5
Mill 2-4		NA	8.0	8.0	7.5	7.5	7.5	8.0	8.0
Mill 2-5		NA	8.0	7.0	7.0	7.0	7.0	7.0	8.0
Diff. Press. 2-1	"H_2O	NA	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Diff. Press. 2-2		NA	6.0	6.0	6.0	5.7	5.7	6.0	6.0
Diff. Press. 2-3		NA	7.5	7.7	7.7	7.7	7.5	7.5	7.5
Diff. Press. 2-4		NA	7.5	7.0	7.0	7.0	7.0	7.5	7.5
Diff. Press. 2-5		NA	7.5	7.0	7.5	7.6	7.6	7.5	7.5
Mill 2-1 Suction		NA	-1.0	-1.4	-1.3	-1.3	-1.3	-1.4	-1.4
Mill 2-2 Suction		NA	-2.0	-2.2	-2.2	-2.4	-2.4	-2.4	-2.4
Mill 2-3 Suction		NA	-1.8	-1.9	-2.0	-2.0	-1.8	-2.0	-2.0
Mill 2-4 Suction		NA	-1.5	-1.8	-1.5	-2.0	-2.0	-2.2	-2.0
Mill 2-5 Suction		NA	-1.7	-1.6	-1.6	-1.6	-1.6	-1.9	-1.6
Mill 2-1 Feeder Speed % Full		NA	72	68	70	70	68	68	68
Mill 2-2 Feeder Speed		NA	74	69	70	70	69	68	68
Mill 2-3 Feeder Speed		NA	72	69	70	69	69	68	68
Mill 2-4 Feeder Speed		NA	72	69	70	70	69	68	68
Mill 2-5 Feeder Speed		NA	72	67	70	70	68	66	66

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		141	142	143	144	145	146	147	148
Date	1981	11/10	11/10	11/10	11/10	11/10	11/10	11/11	11/11
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		66	68	68	69	66	72	64	68
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		68	70	70	71	68	72	64	68
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		78	82	80	83	78	70	75	82
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		74	78	76	79	74	80	74	76
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		0	0	0	0	0	0	18	0
SH Spray R		0	0	0	0	0	0	31	0
RH Spray		0	0	0	0	0	0	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		73	72.7	73	74	72	71	70	73
Coal Flow 2-2		74	73.4	74	74	73	72	71	74
Coal Flow 2-3		74	74.0	74	75	74	73	71	75
Coal Flow 2-4		74	73.7	74	75	74	72	71	74
Coal Flow 2-5		74	73	74	74	73	72	62	74
Coal Air Temp. 2-1, °F		164	164	163	NA	163	164	164	164
Coal Air Temp. 2-2		163	163	163	NA	163	163	163	163
Coal Air Temp. 2-3		163	161	161	NA	164	163	163	164
Coal Air Temp. 2-4		161	161	161	NA	161	160	167	162
Coal Air Temp. 2-5		162	161	164	NA	162	162	161	162
Mill 2-1	Amps	71	74	73	NA	72	72	71	73
Mill 2-2		72	74	73	NA	73	74	73	73
Mill 2-3		73	72	72	NA	70	72	71	73
Mill 2-4		73	73	73	NA	73	73	71	73
Mill 2-5		73	75	75	NA	75	75	71	76
Exh. Discharge	"H_2O								
Mill 2-1		8.5	8.6	8.8	8.6	8.3	8.5	8.3	8.5
Mill 2-2		8.5	8.8	8.8	8.6	8.5	8.5	8.4	8.5
Mill 2-3		8.0	7.8	7.8	8.0	8.0	8.0	7.8	8.8
Mill 2-4		8.0	8.5	8.3	8.3	8.4	8.0	8.5	8.6
Mill 2-5		7.0	7.0	7.0	7.0	7.0	7.0	6.9	7.0
Diff. Press. 2-1	"H_2O	8.3	8.5	8.5	8.3	8.5	8.5	8.2	8.5
Diff. Press. 2-2		6.3	6.3	6.3	6.1	6.0	6.0	8.5	6.0
Diff. Press. 2-3		7.8	7.8	8.0	7.8	7.5	7.7	7.7	7.7
Diff. Press. 2-4		7.3	7.4	8.0	7.4	7.0	7.2	7.2	7.3
Diff. Press. 2-5		8.0	8.0	7.5	8.0	8.0	7.8	7.5	7.6
Mill 2-1 Suction		-1.2	-1.2	-1.2	-1.2	-1.1	-1.3	-1.4	-1.3
Mill 2-2 Suction		-2.0	-2.1	-2.0	-2.1	-2.2	-2.2	-2.2	-2.2
Mill 2-3 Suction		-1.8	-1.7	-1.8	-1.9	-2.0	-2.2	-2.0	-2.0
Mill 2-4 Suction		-1.7	-1.7	-1.6	-2.0	-2.5	-2.2	-2.0	-1.5
Mill 2-5 Suction		-1.6	-1.5	-1.5	-1.5	-1.5	-1.6	-1.8	-1.6
Mill 2-1 Feeder Speed % Full		74	72	74	74	72	72	69	73
Mill 2-2 Feeder Speed		76	72	75	76	73	71	70	74
Mill 2-3 Feeder Speed		72	72	75	76	72	70	70	73
Mill 2-4 Feeder Speed		75	72	75	75	73	70	70	73
Mill 2-5 Feeder Speed		75	70	75	74	72	70	62	73

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		149	150	151	152	153	154	155	156
Date	1981	11/11	11/11	11/11	11/11	11/12	11/12	11/12	11/12
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		69	70	69	68	66	64	66	66
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		70	71	69	68	67	66	66	66
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		82	84	80	81	80	82	68	76
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		77	80	76	77	76	78	64	72
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		0	0	0	0	18	20	0	10
SH Spray R		0	0	0	0	22	20	0	10
RH Spray		0	0	0	0	0	0	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		72	74	73	72	71	72	72	71
Coal Flow 2-2		72	75	74	73	72	73	73	72
Coal Flow 2-3		73	76	74	74	72	73	74	73
Coal Flow 2-4		73	75	74	73	72	73	73	72
Coal Flow 2-5		73	62	62	64	64	61	61	61
Coal Air Temp. 2-1, °F		163	164	163	164	164	164	164	164
Coal Air Temp. 2-2		161	163	161	162	164	163	163	164
Coal Air Temp. 2-3		161	160	161	164	164	164	164	164
Coal Air Temp. 2-4		161	161	161	161	161	161	161	160
Coal Air Temp. 2-5		161	161	161	486	161	161	161	162
Mill 2-1	Amps	72	74	73	71.5	70.5	71	72	73
Mill 2-2		73	73	74	73	72.2	71	74	72
Mill 2-3		71	71	73	72	72	71	71	71
Mill 2-4		72	73	73	73	70	73	74	73
Mill 2-5		72	71	71	70	69	69	71	69
Exh. Discharge	"H_2O								
Mill 2-1		8.3	8.4	8.5	8.3	8.3	8.0	8.5	8.5
Mill 2-2		8.3	8.0	8.6	8.3	8.2	8.0	8.5	8.5
Mill 2-3		8.5	7.5	8.5	8.0	8.0	8.0	8.0	8.0
Mill 2-4		8.6	8.2	8.1	8.5	8.4	8.5	8.5	7.7
Mill 2-5		8.2	7.5	8.0	7.8	7.9	6.5	6.5	7.0
Diff. Press. 2-1	"H_2O	8.4	8.5	8.2	8.3	8.2	8.0	8.0	8.2
Diff. Press. 2-2		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Diff. Press. 2-3		7.7	8.3	7.5	7.3	6.2	7.5	7.5	7.5
Diff. Press. 2-4		7.3	7.3	7.3	7.3	7.0	7.0	7.0	7.0
Diff. Press. 2-5		7.6	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Mill 2-1 Suction		-1.3	-1.1	-1.4	-1.1	-1.4	-1.3	-1.3	-1.2
Mill 2-2 Suction		-2.2	-1.9	-2.2	-2.2	-2.2	-2.2	-2.1	-2.2
Mill 2-3 Suction		-2.0	-1.8	-2.1	-1.9	-1.9	-1.9	-1.8	-1.9
Mill 2-4 Suction		-1.8	-1.6	-2.1	-1.9	-1.9	-1.6	-1.8	-1.6
Mill 2-5 Suction		-1.6	-1.7	-1.8	-1.8	-1.7	-1.8	-1.9	-1.8
Mill 2-1 Feeder Speed % Full		72	76	72	72	72	72	72	73
Mill 2-2 Feeder Speed		72	76	73	72	72	74	72	72
Mill 2-3 Feeder Speed		72	76	72	72	72	72	73	71
Mill 2-4 Feeder Speed		70	74	72	70	71	73	73	72
Mill 2-5 Feeder Speed		70	63	70	74	64	61	61	61

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		157	158	159	160	161	162	163	164
Date	1981	11/12	11/12	11/12	11/12	11/12	11/12	11/12	11/12
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		66	66	66	66	69	67	68	66
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		67	68	66	66	70	68	68	67
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		82	78	78	76	84	80	80	78
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		78	74	74	72	78	76	76	72
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		0	0	0	0	0	0	0	0
SH Spray R		11	0	0	0	0	0	0	18
RH Spray		0	20	0	0	0	0	0	18
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		73	73	72	73	74	73	73	72
Coal Flow 2-2		73	74	72	73	74	73	73	73
Coal Flow 2-3		74	74	73	74	75	74	74	73
Coal Flow 2-4		74	74	73	74	74	73	73	73
Coal Flow 2-5		62	62	61	62	62	62	64	63
Coal Air Temp. 2-1, °F		164	164	163	164	164	163	164	164
Coal Air Temp. 2-2		163	163	163	163	164	162	162	164
Coal Air Temp. 2-3		164	164	164	164	164	161	164	164
Coal Air Temp. 2-4		161	161	161	161	161	161	161	160
Coal Air Temp. 2-5		161	162	162	162	162	161	162	163
Mill 2-1	Amps	72	73	72	72	72	72	72	72
Mill 2-2		72	73	73	73	72	73	72	72
Mill 2-3		73	72	72	71	71	71	71	71
Mill 2-4		72	73	73	73	73	72	71	73
Mill 2-5		71	70	70	68	68	68	71	69
Exh. Discharge	"H_2O								
Mill 2-1		8.3	8.6	8.3	8.5	8.5	8.5	8.5	8.5
Mill 2-2		8.5	8.5	8.6	8.5	8.6	8.5	8.5	8.5
Mill 2-3		7.5	8.0	7.8	8.0	8.0	8.1	8.0	8.0
Mill 2-4		7.0	8.0	8.5	9.0	8.5	8.5	9.0	9.0
Mill 2-5		7.5	7.0	6.8	7.0	7.0	6.3	7.0	7.0
Diff. Press. 2-1	"H_2O	8.2	8.0	8.2	8.5	8.1	8.3	8.0	8.0
Diff. Press. 2-2		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Diff. Press. 2-3		7.5	7.5	7.5	7.5	7.6	7.5	7.5	7.5
Diff. Press. 2-4		7.0	7.0	7.3	7.0	7.3	7.3	7.5	7.0
Diff. Press. 2-5		7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Mill 2-1 Suction		-1.4	-1.3	-1.3	-1.1	-1.3	-1.2	-1.3	-1.3
Mill 2-2 Suction		-2.1	-2.1	-2.1	-2.2	-2.2	-2.2	-2.1	-2.0
Mill 2-3 Suction		-1.8	-1.8	-1.8	-1.8	-1.9	-1.8	-1.9	-1.8
Mill 2-4 Suction		-1.7	-1.7	-1.6	-1.7	-1.7	-1.5	-1.7	-1.8
Mill 2-5 Suction		-1.8	-1.8	-1.8	-1.8	-1.7	-1.4	-1.8	-1.8
Mill 2-1 Feeder Speed % Full		71	74	73	74	73	73	73	74
Mill 2-2 Feeder Speed		73	74	74	74	74	74	73	74
Mill 2-3 Feeder Speed		71	74	74	74	74	74	73	74
Mill 2-4 Feeder Speed		73	74	74	74	74	74	74	74
Mill 2-5 Feeder Speed		61	62	71	62	62	62	64	64

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		167*	168	169	170	171	172	173	174
Date	1981	11/13	11/13	11/13	11/13	11/16	11/16	11/16	11/16
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		68	68	68	68	67	66	68	68
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		68	69	68	68	68	68	69	67
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		84	80	80	82	78	77	77	81
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		78	76	75	78	78	78	80	81
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		0	0	0	0	0	15	10	10
SH Spray R		0	0	0	0	0	10	10	10
RH Spray		0	0	0	0	0	0	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		73	74	74	72	72	72	71	72
Coal Flow 2-2		73	74	74	72	72	72	71	71
Coal Flow 2-3		74	75	75	73	72	72	72	72
Coal Flow 2-4		73	75	75	73	72	72	72	72
Coal Flow 2-5		60	60	60	64	62	62	62	62
Coal Air Temp. 2-1, °F		163	164	164	164	165	165	164	163
Coal Air Temp. 2-2		162	163	163	163	165	164	164	164
Coal Air Temp. 2-3		164	164	164	164	164	164	164	164
Coal Air Temp. 2-4		162	161	163	163	NA	NA	NA	NA
Coal Air Temp. 2-5		163	163	163	163	164	163	162	162
Mill 2-1	Amps	73	73	73	73	72	73	72	71
Mill 2-2		73	72	72	72	72	71	72	72
Mill 2-3		72	71	70	73	72	73	72	71
Mill 2-4		74	73	73	73	71	70	73	72
Mill 2-5		71	69	70	71	70	69	71	69
Exh. Discharge	"H_2O	8.5	8.5	8.5	8.5	8.5	8.3	8.0	8.5
Mill 2-1		8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0
Mill 2-2		8.0	7.5	8.0	8.0	8.0	8.0	8.0	8.0
Mill 2-3		8.5	8.0	8.5	8.5	8.0	8.4	7.5	8.0
Mill 2-4		7.0	6.0	6.5	7.0	7.0	6.5	7.3	6.5
Mill 2-5		8.0	8.0	8.0	8.5	8.0	8.0	8.0	8.0
Diff. Press. 2-1	"H_2O	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.7
Diff. Press. 2-2		7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Diff. Press. 2-3		7.0	7.0	7.5	7.5	7.0	7.0	7.0	7.0
Diff. Press. 2-4		7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Diff. Press. 2-5		-1.2	-1.2	-1.2	-1.4	-1.3	-1.3	-1.4	-1.3
Mill 2-1 Suction		-2.1	-2.0	-2.0	-2.1	-2.2	-2.3	-2.4	-2.3
Mill 2-2 Suction		-1.7	-1.9	-1.8	-1.9	-2.0	-2.0	-2.0	-2.0
Mill 2-3 Suction		-1.7	-1.8	-1.5	-1.7	-1.7	-1.8	-1.8	-1.8
Mill 2-4 Suction		-1.9	-1.8	-1.8	-1.7	-1.8	-1.9	-1.9	-1.9
Mill 2-5 Suction		73	72	74	73	71	72	72	72
Mill 2-1 Feeder Speed % Full		74	73	75	73	71	72	72	72
Mill 2-2 Feeder Speed		74	73	75	73	71	72	72	72
Mill 2-3 Feeder Speed		74	73	75	73	71	72	72	72
Mill 2-4 Feeder Speed		60	58	60	64	60	62	61	62
Mill 2-5 Feeder Speed									

* Board & Computer Data for Tests 165 and 166 Lost

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		175	176	177	178	179	180	181	182
Date	1981	11/16	11/16	11/16	11/16	11/16	11/16	11/16	11/17
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		65	66	68	66	66	66	68	70
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		66	67	68	67	66	68	68	71
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		76	76	81	78	79	74	76	83
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		76	76	81	78	79	74	76	82
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		20	23	20	20	10	0	0	10
SH Spray R		18	0	0	20	3	0	0	0
RH Spray		0	0	0	0	0	0	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		72	71	71	71	72	72	72	73
Coal Flow 2-2		72	71	71	71	72	72	72	73
Coal Flow 2-3		72	72	72	72	73	72	72	73
Coal Flow 2-4		72	72	71	71	73	72	72	73
Coal Flow 2-5		62	61	61	62	63	62	62	64
Coal Air Temp. 2-1, °F		164	165	165	165	165	164	164	164
Coal Air Temp. 2-2		163	164	164	164	164	163	164	163
Coal Air Temp. 2-3		164	164	164	164	164	164	164	164
Coal Air Temp. 2-4		NA	NA	NA	NA	NA	NA	NA	NA
Coal Air Temp. 2-5		162	162	163	163	163	161	163	162
Mill 2-1	Amps	72	73	72	73	73	71	72	73
Mill 2-2		71	71	72	72	72	72	72	72
Mill 2-3		71	72	70	73	71	70	71	71
Mill 2-4		73	71	72	73	72	71	72	70
Mill 2-5		68	70	69	70	70	71	70	71
Exh. Discharge	"H_2O								
Mill 2-1		8.0	8.5	8.0	8.5	8.5	8.5	8.5	8.0
Mill 2-2		8.0	8.5	8.0	8.0	8.0	8.0	8.0	8.0
Mill 2-3		8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5
Mill 2-4		8.0	8.0	8.0	8.0	8.5	9.0	8.5	7.5
Mill 2-5		6.5	7.0	5.5	6.5	7.0	7.0	7.0	7.0
Diff. Press. 2-1	"H_2O	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.5
Diff. Press. 2-2		6.0	7.0	6.0	6.0	6.0	6.0	6.0	6.0
Diff. Press. 2-3		7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Diff. Press. 2-4		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Diff. Press. 2-5		7.5	7.5	7.5	7.5	7.5	7.0	7.5	7.5
Mill 2-1 Suction		-1.4	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3
Mill 2-2 Suction		-2.4	-2.3	-2.3	-2.4	-2.2	-2.2	-2.2	-2.2
Mill 2-3 Suction		-1.9	-2.0	-2.0	-2.1	-1.9	-2.0	-2.0	-1.9
Mill 2-4 Suction		-1.8	-1.8	-2.0	-2.1	-1.7	-1.9	-1.9	-1.8
Mill 2-5 Suction		-1.8	-1.8	-2.0	-1.9	-1.8	-1.9	-1.8	-1.7
Mill 2-1 Feeder Speed % Ful		72	72	71	71	73	72	72	73
Mill 2-2 Feeder Speed		72	72	71	71	72	72	72	72
Mill 2-3 Feeder Speed		72	72	71	71	72	71	72	72
Mill 2-4 Feeder Speed		72	72	71	71	72	71	72	72
Mill 2-5 Feeder Speed		62	61	60	60	62	61	62	62

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		183	184	185	186	187
Date	1981	11/17	11/17	11/17	11/17	11/17
FAN DAMPER, % Open						
FD Fan 2-1 Inlet		72	72	71	71	68
FD Fan 2-1 Outlet		100	100	100	100	100
FD Fan 2-2 Inlet		72	72	72	71	68
FD Fan 2-2 Outlet		100	100	100	100	100
ID Fan 2-1 Inlet		83	84	86	81	78
ID Fan 2-1 Outlet		100	100	100	100	100
ID Fan 2-2 Inlet		81	82	83	80	78
ID Fan 2-2 Outlet		100	100	100	100	100
SPRAY VALVES, % Open						
SH Spray L		0	0	0	0	0
SH Spray R		0	0	0	0	0
RH Spray		0	0	0	0	0
MILL DATA						
Coal Flow 2-1 10E3 LB/HR		72	72	73	73	74
Coal Flow 2-2		72	72	73	73	74
Coal Flow 2-3		73	72	74	73	74
Coal Flow 2-4		73	72	73	73	74
Coal Flow 2-5		63	62	64	64	64
Coal Air Temp. 2-1, °F		165	164	164	164	164
Coal Air Temp. 2-2		164	163	163	164	163
Coal Air Temp. 2-3		165	164	163	163	163
Coal Air Temp. 2-4		NA	NA	NA	NA	NA
Coal Air Temp. 2-5		164	163	162	162	162
Mill 2-1	Amps	73	72	73	73	72
Mill 2-2		72	72	72	72	72
Mill 2-3		72	71	72	72	72
Mill 2-4		73	72	72	73	73
Mill 2-5		71	69	69	71	70
Exh. Discharge	"H_2O					
Mill 2-1		8.6	8.5	8.5	8.5	8.5
Mill 2-2		8.0	8.5	8.5	8.5	8.5
Mill 2-3		8.5	8.5	8.0	8.0	8.0
Mill 2-4		7.5	7.0	8.0	8.0	8.0
Mill 2-5		7.0	7.0	7.0	7.0	7.0
Diff. Press. 2-1	"H_2O	8.5	8.0	8.0	8.0	8.0
Diff. Press. 2-2		6.0	6.0	6.0	6.0	6.0
Diff. Press. 2-3		7.5	7.5	7.5	7.5	7.5
Diff. Press. 2-4		7.0	7.0	7.0	7.0	7.0
Diff. Press. 2-5		7.0	7.0	7.0	7.0	7.5
Mill 2-1 Suction		-1.2	-1.1	-1.2	-1.0	-1.0
Mill 2-2 Suction		-2.0	-1.9	-2.0	-2.2	-2.0
Mill 2-3 Suction		-1.8	-1.7	-1.7	-1.8	-1.7
Mill 2-4 Suction		-1.2	-1.5	-2.0	-1.7	-1.7
Mill 2-5 Suction		-1.2	-1.6	-1.8	-1.8	-1.7
Mill 2-1 Feeder Speed % Ful		72	72	74	74	73
Mill 2-2 Feeder Speed		72	72	74	74	72
Mill 2-3 Feeder Speed		72	72	73	73	72
Mill 2-4 Feeder Speed		72	72	73	73	72
Mill 2-5 Feeder Speed		62	62	63	64	64

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		101	102	103	104	105	106	107	108
Test Date	1981	10/29	10/29	10/30	10/30	10/30	10/30	11/2	11/2
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		46	45.5	35	37	37.4	37.4	51.3	53.1
FD 2-1 Fan Outlet		64.6	63.5	54.6	55.8	56.8	55.9	57.0	65.5
FD 2-2 Fan Outlet		65.0	64.6	55.1	56	57.3	56.1	57.5	64.1
Stm. AH 2-1 Air Outlet		106	106	103	103	103.7	101.8	103	114.6
Stm. AH 2-2 Air Outlet		93	94	90	89	88.6	88.7	87	97.2
AH 2-1 Air Inlet		111	110	107	107	108	106	105	115
AH 2-2 Air Inlet		93	93	83	82	82.4	84	81.5	91
AH 2-1 Air Outlet		492	493	496	497	497	495	496	476
AH 2-2 Air Outlet		521	519	523	524	525	525	519	497
AH 2-1 Gas Inlet		629	623	624	624	628	609	598	562
AH 2-2 Gas Inlet		667	656	666	667	668	674	657	617
AH 2-1 Gas Outlet		254	254	256	257	256	258	257	244
AH 2-2 Gas Outlet		270	267.5	272	273	273	274	274	262
Steam & Water, Degrees F									
Feedwater to Economizer		480	479	482	492	482	481	480	459
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		657	654	650	650	651	652	651	648
Desuperheater Inlet L		736	740	744	745	750	745	742	742
Desuperheater Inlet R		737	738	751	751	752	747	741	742
Desuperheater Outlet L		737	738	730	723	726	733	731	719
Desuperheater Outlet R		735	740	733	726	728	737	733	721
Throttle Steam		994	1009	1005	1003	1005	1003	1004	1001
Reheat-Cold at Turbine		629	641	640	640	642	639	639	606
Reheat Atemp Inlet L		627	639	638	628	640	636	637	603
Reheat Atemp Inlet R		625	637	638	636	638	634	635	602
Reheat Boiler Outlet		989	1008	1015	1016	1024	1010	1008	991
HP EXTR Steam Inlet		628	640	640	639	641	637	638	604
HP FW Heater Inlet		408	408	411	411	411	409	410	393
HP FW Heater Drain		416	417	416	417	417	416	416	417
Auxiliary Steam		554	467	559	563	561	551	567	552
Miscellaneous									
Burner Tilt LR ± Deg		0	-2.6	-5.0	-5.2	0	0	0	0
Burner Tilt LF ± Deg		1	-2.5	-4.8	-4.8	0	0	0	0
Burner Tilt RF ± Deg		1	-2.2	-5.0	-5.2	0	0	0	0
Burner Tilt RR ± Deg		1	-2.7	-5.0	-5.1	0	0	0	0
Flue Gas Oxygen R		4.42	2.89	2.94	3.6	2.7	4.07	2.9	3.5
Flue Gas Oxygen L		2.74	3.64	4.98	2.9	4.39	2.9	4.2	3.3
Flue Gas Oxygen Avg.		3.58	3.27	3.92	3.18	3.55	3.4	3.5	3.4
Drum Level "H_2O		0.75	0.73	0.14	1.14	0.78	1.00	0.96	0.9
FD Fan 2-1 Amps		120	118.5	125	122	125	125	121	112
FD Fan 2-2 Amps		120	117.8	123	122	123	124	124	112.7
ID Fan 2-1 Amps		252	238.6	261	258	261	259	259	247
ID Fan 2-2 Amps		262	262.6	271	267	270	268	266	250.5

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		109	110	111	112	113	114	115	116
Test Date	1981	11/2	11/2	11/2	11/2	11/3	11/3	11/3	11/3
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		58.0	63.0	67	47.5	58	62.8	64.2	61.6
FD 2-1 Fan Outlet		67	73	76	57.8	66	74.3	74.5	75
FD 2-2 Fan Outlet		66	72	75	57.7	65	73.0	73.6	74
Stm. AH 2-1 Air Outlet		116	116	105	105	106	106	102	102
Stm. AH 2-2 Air Outlet		96	98	90	68	78	94	93	91
AH 2-1 Air Inlet		116	116	108	107	107	108	105	106
AH 2-2 Air Inlet		94	102	88	69	84	94	94	88
AH 2-1 Air Outlet		475	474	496	496	498	493	496	497
AH 2-2 Air Outlet		498	495	520	516	520	516	521	524
AH 2-1 Gas Inlet		563	560	598	600	602	597	613	620
AH 2-2 Gas Inlet		620	610	655	653	653	647	666	676
AH 2-1 Gas Outlet		244	244	255	255	254	255	259	259
AH 2-2 Gas Outlet		263	261	269	252	263	269	269	273
Steam & Water, Degrees F									
Feedwater to Economizer		460	460	481	480	482	479	479	480
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		648	647	654	652	651	656	654	653
Desuperheater Inlet L		746	736	743	740	740	729	741	747
Desuperheater Inlet R		745	737	743	738	739	735	751	748
Desuperheater Outlet L		713	712	717	728	720	735	751	749
Desuperheater Outlet R		715	714	720	731	722	731	744	749
Throttle Steam		1007	1003	1002	1004	1003	982	1009	1026
Reheat-Cold at Turbine		612	607	639	639	640	619	642	656
Reheat Atemp Inlet L		610	605	636	636	601	616	639	653
Reheat Atemp Inlet R		608	603	636	636	637	616	632	653
Reheat Boiler Outlet		1007	1001	1015	1007	1010	970	998	1018
HP EXTR Steam Inlet		610	606	637	638	639	618	640	655
HP FW Heater Inlet		394	394	411	410	412	409	409	469
HP FW Heater Drain		421	422	424	419	427	427	429	431
Auxiliary Steam		532	553	488	569	539	506	502	509
Miscellaneous									
Burner Tilt LR ± Deg		+1	0	0	0	0	+1	+4	0
Burner Tilt LF ± Deg		+1	0	0	0	0	+1	+4	0
Burner Tilt RF ± Deg		+1	0	0	0	0	+1	+4	0
Burner Tilt RR ± Deg		+1	0	0	0	0	+1	+4	0
Flue Gas Oxygen R		3.44	2.56	2.9	2.9	1.64	2.77	4.80	5.3
Flue Gas Oxygen L		3.15	2.64	3.01	3.1	2.5	3.83	5.85	5.0
Flue Gas Oxygen Avg.		3.3	2.14	2.97	2.97	2.07	3.30	5.36	5.2
Drum Level "H_2O		0.86	0.7	0.64	0.82	0.84	0.65	0.65	0.7
FD Fan 2-1 Amps		111	107	117	118	115	113	138	126
FD Fan 2-2 Amps		112	110	120	120	119	120	133	129
ID Fan 2-1 Amps		246	242	256	253	253	256	268	265
ID Fan 2-2 Amps		251	249	265	263	260	266	283	278

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		117	118	119	120	121	122	123	124
Test Date	1981	11/3	11/4	11/4	11/4	11/4	11/4	11/4	11/4
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		66	48	53	55.5	63	61	60.7	5.8
FD 2-1 Fan Outlet		75	59	63	66	70	72	72	72
FD 2-2 Fan Outlet		74	60	63	66	70	71	71	71
Stm. AH 2-1 Air Outlet		104	103	105	106	107	107	106	107
Stm. AH 2-2 Air Outlet		95	92	90.4	93	93	93	92.4	91
AH 2-1 Air Inlet		108	102	109	111	109	110	108	109
AH 2-2 Air Inlet		98	83	84	89	93	91	93	91
AH 2-1 Air Outlet		495	492	493	491	489	489	491	492
AH 2-2 Air Outlet		523	515	516	515	513	513	514	517
AH 2-1 Gas Inlet		608	598	589	598	592	594	598	601
AH 2-2 Gas Inlet		655	648	650	647	642	642	643	650
AH 2-1 Gas Outlet		256	258	255	254	253	253	254	254
AH 2-2 Gas Outlet		274	273	272	270	270	270	269	270
Steam & Water, Degrees F									
Feedwater to Economizer		479	480	480	480	479	478	479	479
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		656	644	644	646	647	648	648	647
Desuperheater Inlet L		733	733	735	733	722	721	726	736
Desuperheater Inlet R		730	738	739	738	738	729	726	738
Desuperheater Outlet L		732	732	731	735	729	728	735	739
Desuperheater Outlet R		734	734	735	734	723	722	727	737
Throttle Steam		991	1005	1004	1001	964	954	976	1010
Reheat-Cold at Turbine		628	633	639	636	604	586	614	643
Reheat Atemp Inlet L		623	637	637	634	602	598	612	640
Reheat Atemp Inlet R		624	637	636	633	602	593	612	640
Reheat Boiler Outlet		984	987	998	991	941	930	958	1001
HP EXTR Steam Inlet		625	638	638	635	603	595	613	643
HP FW Heater Inlet		409	408	409	419	409	408	408	409
HP FW Heater Drain		426	419	417	419	421	421	421	422
Auxiliary Steam		519	502	498	503	502	494	480	479
Miscellaneous									
Burner Tilt LR ± Deg		1	0	0	0	0	0	0	0
Burner Tilt LF ± Deg		1	0	0	0	0	0	0	0
Burner Tilt RF ± Deg		1	0	0	0	0	0	0	0
Burner Tilt RR ± Deg		1	0	0	0	0	0	0	0
Flue Gas Oxygen R		4.6	2.4	2.8	2.7	2.57	2.7	2.72	2.83
Flue Gas Oxygen L		2.8	3.7	3.6	3.9	2.65	4.2	4.39	2.93
Flue Gas Oxygen Avg.		3.8	3.07	3.2	3.3	3.16	3.4	3.60	3.33
Drum Level	"H_2O	1.39	2.05	2.13	1.75	1.78	1.86	2.07	1.96
FD Fan 2-1	Amps	122	121	120	120	117	118	120	121
FD Fan 2-2	Amps	122	123	123	123	120	121	121	123
ID Fan 2-1	Amps	259	257	258	253	257	256	257	256
ID Fan 2-2	Amps	268	267	265	264	265	267	266	266

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		125	126	127	128	129	130	131	132
Test Date	1981	11/5	11/5	11/5	11/5	11/6	11/6	11/6	11/6
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		46.68	52.0	54.5	54.5	41.09	41.8	43	40
FD 2-1 Fan Outlet		58.5	63.0	66.6	69	53.8	56.6	58	55
FD 2-2 Fan Outlet		58.65	63.5	66.6	70	53.0	56.6	58	54
Stm. AH 2-1 Air Outlet		104	102.6	104	103	102	101.6	103	104
Stm. AH 2-2 Air Outlet		91	90.7	91.6	91.4	90.5	90.7	90.6	89
AH 2-1 Air Inlet		108	107	108	107	104	104	106	107
AH 2-2 Air Inlet		84	96	88	92	87	87	85	84
AH 2-1 Air Outlet		494	495	485	496	494	494	495	497
AH 2-2 Air Outlet		520	508	521	521	509	518	520	522
AH 2-1 Gas Inlet		598	605	610	608	604	609	608	608
AH 2-2 Gas Inlet		660	655	668	659	659	658	657	660
AH 2-1 Gas Outlet		255	257	256	257	256	256	255	255
AH 2-2 Gas Outlet		271	271	271	272	273	272	272	272
Steam & Water, Degrees F									
Feedwater to Economizer		482	483	484	487	485	485	487	488
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		642	644	645	646	644	643	647	645
Desuperheater Inlet L		742	726	738	738	735	730	725	731
Desuperheater Inlet R		742	740	738	738	749	745	738	732
Desuperheater Outlet L		724	740	737	738	733	745	738	733
Desuperheater Outlet R		726	727	727	730	736	731	726	732
Throttle Steam		1002	985	970	1000	1004	1008	1010	1000
Reheat-Cold at Turbine		638	630	618	646	648	646	654	647
Reheat Atemp Inlet L		636	627	616	643	645	641	652	645
Reheat Atemp Inlet R		635	626	615	642	644	640	651	644
Reheat Boiler Outlet		1001	971	964	999	1008	991	1003	1003
HP EXTR Steam Inlet		687	624	617	644	646	648	653	646
HP FW Heater Inlet		411	412	412	415	414	412	415	416
HP FW Heater Drain		419	421	422	428	422	421	423	424
Auxiliary Steam		468	446	473	461	472	467	457	457
Miscellaneous									
Burner Tilt LR ± Deg		+4.7	+6.1	+5.0	+10	-2	12	19	-6
Burner Tilt LF ± Deg		-4.8	+6.3	5.0	+10	-2	12	19	-6
Burner Tilt RF ± Deg		-4.9	+5.6	5.0	+9	-2	12	19	-6
Burner Tilt RR ± Deg		-4.8	+6.8	5.0	+10	-2	12	19	-6
Flue Gas Oxygen R		2.38	2.5	4.4	3.0	3.04	2.89	0.98	1.70
Flue Gas Oxygen L		4.08	5.0	2.4	4.4	4.13	4.81	4.14	2.88
Flue Gas Oxygen Avg.		3.48	3.7	3.4	3.7	3.43	3.83	2.58	2.27
Drum Level	"H_2O	2.01	1.8	2.05	2.06	2.06	1.86	2.1	2.1
FD Fan 2-1	Amps	123	128	126	126	126	126	126	122
FD Fan 2-2	Amps	125	132	128	128	129	129	127	125
ID Fan 2-1	Amps	260	265	263	264	266	263	262	257
ID Fan 2-2	Amps	268	276	274	267	277	277	275	269

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		133	134	135	136	137	138	139	140
Test Date	1981	11/6	11/6	11/9	11/9	11/9	11/9	11/9	11/9
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		NA	41	48.6	54.2	51.2	53.0	51	52
FD 2-1 Fan Outlet		NA	55	61.2	65.04	66	66.3	67	67
FD 2-2 Fan Outlet		NA	55	61.2	64.0	65	65.5	66	66
Stm. AH 2-1 Air Outlet		NA	90	89.28	88.4	89	89	88	90
Stm. AH 2-2 Air Outlet		NA	91	95.6	96.8	96.6	96.0	95	96
AH 2-1 Air Inlet		NA	99	90	89.5	90.4	90.2	91	91
AH 2-2 Air Inlet		NA	85	91	91.7	91	89.8	88	90
AH 2-1 Air Outlet		NA	490	505	502	503	504.7	506	504
AH 2-2 Air Outlet		NA	525	521	518	519	519	520	518
AH 2-1 Gas Inlet		NA	626	617	601	602.5	603	606	602
AH 2-2 Gas Inlet		NA	674	668	661	663	664	666	656
AH 2-1 Gas Outlet		NA	264	261	260	261.5	262	265	265
AH 2-2 Gas Outlet		NA	272	267	265	265	265	267	266
Steam & Water, Degrees F									
Feedwater to Economizer		NA	486	486	487	487	487	487	487
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		NA	642	643	645	644.4	645	645	647
Desuperheater Inlet L		NA	739	732	730	730	731	731	730
Desuperheater Inlet R		NA	747	743	740	740	742	742	738
Desuperheater Outlet L		NA	448	728	735	731	734	739	737
Desuperheater Outlet R		NA	741	730	730	729	731	730	731
Throttle Steam		NA	1013	1005	1002	996	998	993	986
Reheat-Cold at Turbine		NA	652	643	647	643	643	640	634
Reheat Atemp Inlet L		NA	648	647	644	641	640	638	631
Reheat Atemp Inlet R		NA	648	646	644	640	640	637	631
Reheat Boiler Outlet		NA	996	1007	1001	1001	1001	1000	989
HP EXTR Steam Inlet		NA	656	648	646	642	642	639	632
HP FW Heater Inlet		NA	413	415	414	415	414	415	415
HP FW Heater Drain		NA	424	438	445	442	441	441	441
Auxiliary Steam		NA	458	524	487	473	463	454	450
Miscellaneous									
Burner Tilt LR ± Deg		8	+10	+20	+26	+22	+22	+20	+26
Burner Tilt LF ± Deg		8	+10	+21	+26	+23	+22	+20	+26
Burner Tilt RF ± Deg		8	+10	+20	+26	+22	+22	+20	+25
Burner Tilt RR ± Deg		8	+10	+21	+24	+24	+23	+21	+25
Flue Gas Oxygen R		NA	3.9	3.66	2.84	3.50	3.36	3.58	2.8
Flue Gas Oxygen L		NA	4.8	2.03	2.74	2.63	2.64	2.8	4.7
Flue Gas Oxygen Avg.		NA	4.4	2.96	2.79	3.05	3.06	3.23	3.8
Drum Level "H_2O		NA	1.38	1.06	1.03	1.08	1.01	1.04	0.93
FD Fan 2-1 Amps		NA	129	126	125	124	125	125	126
FD Fan 2-2 Amps		NA	131	129	125	127	126	128	128
ID Fan 2-1 Amps		NA	269	270	272	270	271	272	270
ID Fan 2-2 Amps		NA	278	270	269	270	279	271	270

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		141	142	143	144	145	146	147	148
Test Date	1981	11/10	11/10	11/10	11/10	11/10	11/10	11/11	11/11
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		49	49.2	51.66	NA	58.5	54	41.7	45.4
FD 2-1 Fan Outlet		56.6	59.5	62	NA	65.7	65	407	54.5
FD 2-2 Fan Outlet		56.0	59.1	61	NA	65.3	65	52.2	54.6
Stm. AH 2-1 Air Outlet		99.3	98.5	99.4	NA	98.2	100	106.5	94.6
Stm. AH 2-2 Air Outlet		63.6	66.4	68.4	NA	93.6	87	86.4	92.3
AH 2-1 Air Inlet		103	103	104	NA	99.8	106	110	979
AH 2-2 Air Inlet		61	64	66	NA	88.5	87	81	89.0
AH 2-1 Air Outlet		499	499	499	NA	501	495	494	505
AH 2-2 Air Outlet		515	515	517	NA	522	528	523	524
AH 2-1 Gas Inlet		610	612	612	NA	612	624	606	618
AH 2-2 Gas Inlet		670	675	673	NA	662	684	661	670
AH 2-1 Gas Outlet		260	261	260	NA	261	259	252	263
AH 2-2 Gas Outlet		244	248	247	NA	269	275	275	270
Steam & Water, Degrees F									
Feedwater to Economizer		487	487	486	NA	487	486	482	488
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		642	642	643	NA	645	645	640	643
Desuperheater Inlet L		729	731	733	NA	732	740	745	737
Desuperheater Inlet R		742	741	742	NA	738	746	745	744
Desuperheater Outlet L		740	738	739	NA	737	744	729	741
Desuperheater Outlet R		723	731	732	NA	734	740	731	738
Throttle Steam		1008	999	1001	NA	1001	993	1006	1003
Reheat-Cold at Turbine		652	645	647	NA	646	659	642	650
Reheat Atemp Inlet L		649	643	644	NA	643	636	640	647
Reheat Atemp Inlet R		649	642	644	NA	643	636	639	647
Reheat Boiler Outlet		1005	1000	1000	NA	1004	993	1011	1004
HP EXTR Steam Inlet		651	644	644	NA	645	638	641	649
HP FW Heater Inlet		414	415	414	NA	415	414	411	416
HP FW Heater Drain		450	450	449	NA	449	447	438	434
Auxiliary Steam		457	474	477	NA	541	506	534	537.5
Miscellaneous									
Burner Tilt LR ± Deg		18	18	20	26	19	22	-2	-1
Burner Tilt LF ± Deg		18	18	20	26	19	22	-2	-1
Burner Tilt RF ± Deg		17	17	19	25	18	21	-2	-1
Burner Tilt RR ± Deg		19	19	21	25	20	23	-2	-1
Flue Gas Oxygen R		3.2	5.67	3.38	NA	3.2	4.72	3.69	3.7
Flue Gas Oxygen L		3.0	2.72	2.85	NA	2.7	4.04	4.14	4.9
Flue Gas Oxygen Avg.		3.0	3.18	3.05	NA	3.0	4.35	3.93	4.2
Drum Level "H_2O		0.7	1.02	1.05	NA	0.92	0.92	0.84	0.97
FD Fan 2-1 Amps		128	130	130	NA	127	135	126	131
FD Fan 2-2 Amps		131	132	133	NA	127	134	126	132
ID Fan 2-1 Amps		270	269.2	272	NA	270	277	261	270
ID Fan 2-2 Amps		278	279	279	NA	270	296	273	280

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		149	150	151	152	153	154	155	156
Test Date	1981	11/11	11/11	11/11	11/11	11/12	11/12	11/12	11/12
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		50.3	48.6	56.3	56.7	50.5	50.8	48	52
FD 2-1 Fan Outlet		57	60.2	66.2	66.6	57.5	59	61	61
FD 2-2 Fan Outlet		57	60.08	66.2	67.0	56.4	59	60	61
Stm. AH 2-1 Air Outlet		93.7	95	96.2	96	96.3	96	97	97
Stm. AH 2-2 Air Outlet		95	95	95.0	99	93.9	95	96	96
AH 2-1 Air Inlet		98.6	99.6	99	87	99	98	98	98
AH 2-2 Air Inlet		90.7	90.5	86	501	89	91	91	91
AH 2-1 Air Outlet		507	506	501	519	503	504	503	504
AH 2-2 Air Outlet		523	526	520	603	519	518	517	520
AH 2-1 Gas Inlet		617	625	604	654	600	601	601	603
AH 2-2 Gas Inlet		664	679	652	654	654	643	647	655
AH 2-1 Gas Outlet		265	264	263	264	263	264	262	263
AH 2-2 Gas Outlet		NA	268	269	270	268	268	266	267
Steam & Water, Degrees F									
Feedwater to Economizer		487	487	486	487	488	488	487	487
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		643	644	649	646	644	644	644	644
Desuperheater Inlet L		734	741	732	730	734	731	630	736
Desuperheater Inlet R		742	745	740	736	737	738	738	739
Desuperheater Outlet L		742	744	738	734	721	723	732	730
Desuperheater Outlet R		736	741	732	731	723	725	731	733
Throttle Steam		995	1001	1002	989	1604	1001	1001	999
Reheat-Cold at Turbine		643	647	644	636	651	648	647	646
Reheat Atemp Inlet L		641	645	642	634	649	645	644	644
Reheat Atemp Inlet R		640	644	641	633	648	645	644	643
Reheat Boiler Outlet		992	999	987	982	1009	1005	999	1008
HP EXTR Steam Inlet		641	646	642	635	649	647	645	645
HP FW Heater Inlet		414	414	414	414	416	416	415	415
HP FW Heater Drain		435	438	446	446	436	437	435	439
Auxiliary Steam		544	537	470	468	540	537	536	525
Miscellaneous									
Burner Tilt LR ± Deg		8	+24	+30	+20	17	14	14	+1
Burner Tilt LF ± Deg		8	+25	+29	+20	17	14	14	0
Burner Tilt RF ± Deg		7	+24	+30	+20	17	15	13	0
Burner Tilt RR ± Deg		8	+24	+25	+20	17	15	14	0
Flue Gas Oxygen R		3.70	5.34	4.4	3.77	3.79	2.7	2.6	2.76
Flue Gas Oxygen L		5.24	3.79	2.5	2.81	2.75	3.4	3.6	4.1
Flue Gas Oxygen Avg.		4.47	4.44	3.5	3.32	3.37	3.0	3.1	3.42
Drum Level "H_2O		1.06	1.29	1.09	.82	1.2	1.06	0.79	0.53
FD Fan 2-1 Amps		133	126.4	129.4	126	125	125	125	126
FD Fan 2-2 Amps		133	136.1	130	126	134	126	126	127
ID Fan 2-1 Amps		278	285.7	278	272	267	265	268	271
ID Fan 2-2 Amps		282	286.4	280	271	270	266	270	270

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		157	158	159	160	161	162	163	164
Test Date	1981	11/12	11/12	11/12	11/12	11/12	11/12	11/12	11/12
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		56.6	52.8	52.7	51	53	55.7	52	58
FD 2-1 Fan Outlet		62	63	64.3	64	65	65	65	65.5
FD 2-2 Fan Outlet		63	63	63.2	64	65	65	65	65
Stm. AH 2-1 Air Outlet		97	97	96	97	96	96	96	97
Stm. AH 2-2 Air Outlet		96	93	93	95	96	95	94	94
AH 2-1 Air Inlet		99	98	98	98	98	98	98	99
AH 2-2 Air Inlet		90	87	88	89	90	90	87	86
AH 2-1 Air Outlet		504	504	503	502	502	504	504	504
AH 2-2 Air Outlet		522	523	521	520	518	519	521	523
AH 2-1 Gas Inlet		603	605	602	600	609	611	609	608
AH 2-2 Gas Inlet		661	661	656	653	643	655	658	665
AH 2-1 Gas Outlet		263	264	263	262	263	264	264	262
AH 2-2 Gas Outlet		267	269	266	267	266	268	269	268
Steam & Water, Degrees F									
Feedwater to Economizer		488	487	487					
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		645	645	646	646	645	646	645	647
Desuperheater Inlet L		737	740	734	732	731	732	738	739
Desuperheater Inlet R		738	740	733	733	742	741	740	737
Desuperheater Outlet L		732	734	733	732	743	742	740	733
Desuperheater Outlet R		735	736	735	733	733	733	740	736
Throttle Steam		1001	1007	994	989	1009	1011	1005	1007
Reheat-Cold at Turbine		647	652	642	638	652	656	651	655
Reheat Atemp Inlet L		645	649	640	635	648	654	648	637
Reheat Atemp Inlet R		644	643	640	635	648	654	648	637
Reheat Boiler Outlet		1010	1012	1001	993	998	1012	1015	1010
HP EXTR Steam Inlet		646	651	641	636	650	656	649	653
HP FW Heater Inlet		415	415	415	415	414	415	415	415
HP FW Heater Drain		442	444	442	442	446	446	445	449
Auxiliary Steam		510	503	437	496	488	487	491	492
Miscellaneous									
Burner Tilt LR ± Deg		-9	-4	-11	-8	20	14	-2	-18
Burner Tilt LF ± Deg		-9	-4	-10	-7	20	15	-2	-18
Burner Tilt RF ± Deg		-10	-4	-11	-8	20	13	-2	-19
Burner Tilt RR ± Deg		-10	-4	-11	-8	20	15	-2	-19
Flue Gas Oxygen R		3.04	2.9	2.8	2.7	2.9	2.92	2.8	3.0
Flue Gas Oxygen L		3.75	3.6	3.1	3.1	5.1	4.91	3.7	3.0
Flue Gas Oxygen Avg.		3.39	3.2	2.9	3.0	4.0	3.83	3.2	2.5
Drum Level "H_2O		1.08	1.2	0.78	1.2	1.08	0.86	1.06	1.23
FD Fan 2-1 Amps		126	124	124	124	128	128	125	124
FD Fan 2-2 Amps		127	126	125	125	129	128	125	125
ID Fan 2-1 Amps		270	265	265	267	270	272	268	266
ID Fan 2-2 Amps		269	269	266	266	272	272	269	267

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		167*	168	169	170	171	172	173	174
Test Date	1981	11/13	11/13	11/13	11/13	11/16	11/16	11/16	11/16
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		51	52	59	57	45	45.2	48	51
FD 2-1 Fan Outlet		67	67	68	67	54	56	58	60.5
FD 2-2 Fan Outlet		67	67	67	67	55	56	58	60
Stm. AH 2-1 Air Outlet		97	96	96	95	102	102	102	103
Stm. AH 2-2 Air Outlet		95	95	96	96	87	87	87	88
AH 2-1 Air Inlet		99	98	98	98	108	107	107	108
AH 2-2 Air Inlet		90	88	89	91	81	80	82	82
AH 2-1 Air Outlet		503	501	505	505	499	498	498	499
AH 2-2 Air Outlet		516	515	520	520	523	521	521	524
AH 2-1 Gas Inlet		610	609	614	615	623	624	631	633
AH 2-2 Gas Inlet		650	647	655	656	654	652	648	659
AH 2-1 Gas Outlet		263	265	264	264	257	257	257	256
AH 2-2 Gas Outlet		267	268	267	267	278	277	277	276
Steam & Water, Degrees F									
Feedwater to Economizer		487	487	488	488	487	487	486	487
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		646	647	646	647	643	643	643	644
Desuperheater Inlet L		728	726	733	732	729	729	726	733
Desuperheater Inlet R		738	736	743	740	736	739	735	743
Desuperheater Outlet L		738	736	743	740	729	729	735	731
Desuperheater Outlet R		729	726	734	733	730	729	726	733
Throttle Steam		997	990	1013	997	997	1000	984	1006
Reheat-Cold at Turbine		643	637	657	645	645	646	639	651
Reheat Atemp Inlet L		641	634	654	642	643	644	636	648
Reheat Atemp Inlet R		640	634	653	642	643	643	636	648
Reheat Boiler Outlet		990	979	1015	1001	992	988	974	1000
HP EXTR Steam Inlet		642	535	655	643	644	425	438	649
HP FW Heater Inlet		414	414	415	415	415	419	413	415
HP FW Heater Drain		441	440	445	444	424	425	424	425
Auxiliary Steam		462	461	468	468	499	499	439	498
Miscellaneous									
Burner Tilt LR ± Deg		+19	+19	16	6	12	19	19	19
Burner Tilt LF ± Deg		+19	+19	17	6	13	19	19	19
Burner Tilt RF ± Deg		+18	+18	16	6	12	18	18	18
Burner Tilt RR ± Deg		+20	+20	18	7	13	20	20	20
Flue Gas Oxygen R		3.3	3.4	3.1	3.4	3.6	3.3	3.6	3.6
Flue Gas Oxygen L		4.6	4.8	4.7	4.6	4.4	4.6	4.4	4.1
Flue Gas Oxygen Avg.		4.0	4.1	4.0	4.0	4.0	4.0	4.0	3.8
Drum Level "H_2O		1.03	1.35	0.83	1.05	.95	1.1	0.7	1.0
FD Fan 2-1 Amps		128	130	129	128	128	129	129	128
FD Fan 2-2 Amps		129	131	129	129	128	128	127	129
ID Fan 2-1 Amps		273	272	273	271	265	267	261	263
ID Fan 2-2 Amps		274	274	273	272	280	286	280	283

* Board & Computer Data for Tests 165 and 166 Lost

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		175	176	177	178	179	180	181	182
Test Date	1981	11/16	11/16	11/16	11/16	11/16	11/16	11/16	11/17
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		53	53.5	56	57	60	57	59	44
FD 2-1 Fan Outlet		64	65	66	67	70.5	70.1	71.4	54
FD 2-2 Fan Outlet		64	65	66	66	70.2	70.6	71.8	53
Stm. AH 2-1 Air Outlet		104	102	103	103	104.4	104	105	99
Stm. AH 2-2 Air Outlet		88	87	88	88	88	86	91	92
AH 2-1 Air Inlet		108	108	108	109	107	107	108	104
AH 2-2 Air Inlet		89	83	87	87	90	82	88	89
AH 2-1 Air Outlet		500	498	501	502	502	501	499	501
AH 2-2 Air Outlet		524	521	524	526	529	528	525	522
AH 2-1 Gas Inlet		629	632	637	638	641	637	635	635
AH 2-2 Gas Inlet		658	653	656	660	670	665	659	630
AH 2-1 Gas Outlet		255	257	257	256	256	255	255	260
AH 2-2 Gas Outlet		273	277	276	277	274	276	275	273
Steam & Water, Degrees F									
Feedwater to Economizer		488	487	488	488	488	487	487	487
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		645	646	646	646	646	648	647	644
Desuperheater Inlet L		732	725	726	633	732	736	729	734
Desuperheater Inlet R		740	737	740	644	742	740	737	742
Desuperheater Outlet L		724	731	730	729	735	739	737	734
Desuperheater Outlet R		727	786	729	732	738	737	732	736
Throttle Steam		1002	996	1000	1002	1001	996	988	1000
Reheat-Cold at Turbine		649	644	647	649	647	643	636	646
Reheat Atemp Inlet L		646	641	645	647	645	640	634	643
Reheat Atemp Inlet R		646	641	644	646	645	640	633	642
Reheat Boiler Outlet		1005	986	995	1007	1007	999	985	990
HP EXTR Steam Inlet		647	643	646	648	646	641	685	644
HP FW Heater Inlet		416	415	415	416	415	415	413	414
HP FW Heater Drain		430	429	430	432	433	432	435	424
Auxiliary Steam		497	497	496	495	496	495	485	496
Miscellaneous									
Burner Tilt LR ± Deg		15	19	19	16	0	0	5	18
Burner Tilt LF ± Deg		15	20	20	17	0	0	5	18
Burner Tilt RF ± Deg		14	19	19	16	0	0	5	17
Burner Tilt RR ± Deg		15	20	20	17	0	0	5	19
Flue Gas Oxygen R		1.6	2.6	2.5	2.8	3.32	3.4	3.0	5.2
Flue Gas Oxygen L		3.6	4.0	4.3	3.9	4.39	4.0	4.0	4.1
Flue Gas Oxygen Avg.		2.6	3.4	3.3	3.4	3.86	3.8	3.5	4.7
Drum Level	"H_2O	1.12	0.65	1.01	1.0	0.91	0.63	1.1	1.2
FD Fan 2-1	Amps	124	127	127	127	126	125	126	135
FD Fan 2-2	Amps	125	128	128	127	126	127	126	135
ID Fan 2-1	Amps	258	262	267	263	263	263	264	278
ID Fan 2-2	Amps	276	280	286	281	282	276	281	282

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		183	184	185	186	187
Test Date	1981	11/17	11/17	11/17	11/17	11/17
TEMPERATURES						
Air & Gas, Degrees F						
Ambient Air		54	48.8	55	58	37
FD 2-1 Fan Outlet		61	61.5	66	66	53
FD 2-2 Fan Outlet		61	60.7	66	66	55
Stm. AH 2-1 Air Outlet		99	100	101	99	100
Stm. AH 2-2 Air Outlet		93	92	92	91	90
AH 2-1 Air Inlet		106	106	107	105	104
AH 2-2 Air Inlet		88	89	87	86	85
AH 2-1 Air Outlet		496	495	498	499	497
AH 2-2 Air Outlet		516	516	517	522	519
AH 2-1 Gas Inlet		628	629	634	638	630
AH 2-2 Gas Inlet		648	650	651	659	649
AH 2-1 Gas Outlet		259	259	259	259	255
AH 2-2 Gas Outlet		271	271	271	273	272
Steam & Water, Degrees F						
Feedwater to Economizer		486	486	485	487	486
Economizer Outlet		NA	NA	NA	NA	NA
Boiler Downcomer		644	645	645	646	645
Desuperheater Inlet L		720	724	725	731	726
Desuperheater Inlet R		732	734	737	739	738
Desuperheater Outlet L		731	733	737	739	737
Desuperheater Outlet R		721	723	726	731	728
Throttle Steam		963	974	980	1001	1001
Reheat-Cold at Turbine		615	623	628	647	645
Reheat Atemp Inlet L		612	620	625	644	641
Reheat Atemp Inlet R		611	619	625	644	641
Reheat Boiler Outlet		944	953	963	994	988
HP EXTR Steam Inlet		613	621	626	645	643
HP FW Heater Inlet		413	413	413	414	414
HP FW Heater Drain		425	428	430	433	432
Auxiliary Steam		482	479	593	609	602
Miscellaneous						
Burner Tilt LR ± Deg		18	18	19	23	19
Burner Tilt LF ± Deg		18	18	20	23	20
Burner Tilt RF ± Deg		17	17	20	23	19
Burner Tilt RR ± Deg		20	20	21	24	20
Flue Gas Oxygen R		4.37	4.37	4.5	4.7	2.9
Flue Gas Oxygen L		5.32	5.52	5.1	4.2	3.8
Flue Gas Oxygen Avg.		4.81	4.88	4.8	4.4	3.4
Drum Level "H_2O		1.01	2.92	2.93	0.96	1.04
FD Fan 2-1 Amps		136	134	133	133	128
FD Fan 2-2 Amps		136	135	133	133	128
ID Fan 2-1 Amps		277	276	274	275	263
ID Fan 2-2 Amps		289	291	288	285	275

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	201	202	203	204	205	206
Date	3/16/82	3/16/82	3/16/82	3/16/82	3/16/82	3/16/82
FLOWS, 10E3 LB/HR						
Air Flow	330	3383	3418	3333	3289	3324
Feedwater	3100	3000	3012	3080	3117	3043
Main Steam	2985	2931	2924	2987	2992	2958
Reheat Steam	-	-	-	-	-	-
Auxiliary Steam	52	41	40	41	41	41
Stm. AH Extr.	18	33	31	35	34	38
Stm. AH Aux.	22	0	0	0	0	0
Condensate Flow	2504	2414	2491	2492	2526	2470
Superheat Spray L	0	0	0	0	0	0
Superheat Spray R	0	0	0	0	0	0
Reheat Spray	0	21	21	0	0	0
PRESSURES						
Steam & Water, Psig						
Boiler Drum	2680	2695	2684	2688	2685	2694
Throttle Steam	2407	2417	2408	2409	2405	2413
Turbine 1st Stage	1819	1832	1825	1826	1822	1829
Turbine Cold Reheat	529	597	596	594	593	592
Reheat Inlet	546	550	549	547	547	546
Extr. Steam (HP-FW)	587	593	591	589	588	587
Main Steam	2427	2445	2431	2435	2432	2440
Aux. Steam	348	346	346	347	347	348
Air & Gas, "H_2O						
FD Fan 2-1 Discharge	11.5	12	11.5	11.0	11.3	9.8
FD Fan 2-2 Discharge	11.5	11.5	11.3	11.0	11.2	9.8
AH 2-1 Air Diff.	3.3	3.4	3.7	3.5	3.4	3.5
AH 2-2 Air Diff.	3.4	3.5	3.8	3.5	3.4	3.3
Windbox Pressure L	4.8	4.8	4.7	4.7	4.8	3.2
Windbox Pressure R	4.8	4.8	4.8	4.8	4.8	3.4
WB/Furn. Diff. L	5.0	5.3	5.2	5.5	5.4	3.6
WB/Furn. Diff. R	5.0	5.5	5.5	5.1	5.6	3.8
Furnace Draft	-0.5	-0.3	-0.6	-0.4	-0.2	-0.4
SH Draft Diff.	2.21	2.3	2.3	2.1	2.2	2.2
Econ. Draft Diff.	3.27	3.4	3.6	3.3	3.3	3.3
AH 2-1 Gas Diff.	13	13.8	13.5	12.7	13.0	13.2
AH 2-2 Gas Diff.	13.5	14	13.8	13.3	13.5	13.7
ID Fan 2-1 Inlet	-15.7	-16.5	-16.7	-15.7	-15.5	-15.8
ID Fan 2-2 Inlet	-15.9	-16.6	-17.0	-16.1	-15.8	-16.0
Atm. Barometric "Hg	24.4	24.3	24.3	24.3	24.4	24.4

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	207	208	209	210	211	212
Date	3/16/82	3/16/82	3/17/82	3/17/82	3/17/82	3/17/82
FLOWS, 10E3 LB/HR						
Air Flow	3375	3418	3274	3288	3248	3267
Feedwater	2975	3040	2985	2979	3069	3047
Main Steam	2933	2922	2905	2916	2957	2947
Reheat Steam	-	-	-	-	-	-
Auxiliary Steam	41	42	42	41	41	41
Stm. AH Extr.	36	34	41	35	35	36
Stm. AH Aux.	0	0	0	0	0	0
Condensate Flow	2448	2458	2468	2598	2613	2508
Superheat Spray L	0	0	0	18	0	0
Superheat Spray R	0	0	0	0	0	0
Reheat Spray	0	0	16	0	0	0
PRESSURES						
Steam & Water, Psig						
Boiler Drum	2692	2674	2686	2675	2689	2668
Throttle Steam	2412	2396	2412	2402	2412	2392
Turbine 1st Stage	1828	1817	1822	1814	1822	1807
Turbine Cold Reheat	592	591	592	589	594	588
Reheat Inlet	546	545	545	542	547	542
Extr. Steam (HP-FW)	588	587	587	584	589	584
Main Steam	2440	2424	2439	2427	2438	2418
Aux. Steam	347	349	348	346	348	349
Air & Gas, "H_2O						
FD Fan 2-1 Discharge	11.4	11.4	11.0	11.2	11.0	10.7
FD Fan 2-2 Discharge	11.2	11.2	11.0	11.0	11.0	10.7
AH 2-1 Air Diff.	3.4	3.4	3.3	3.3	3.3	3.2
AH 2-2 Air Diff.	3.3	3.3	3.1	3.3	3.1	3.3
Windbox Pressure L	4.7	4.7	4.7	4.7	4.7	4.6
Windbox Pressure R	4.9	4.8	4.8	4.9	4.8	4.7
WB/Furn. Diff. L	5.1	5.3	5.3	5.3	5.5	5.2
WB/Furn. Diff. R	5.4	5.7	5.6	5.7	5.6	5.4
Furnace Draft	-0.6	-0.6	-0.4	-0.5	-0.5	-0.6
SH Draft Diff.	2.2	2.3	2.1	2.1	2.0	2.1
Econ. Draft Diff.	3.4	3.4	3.2	3.3	3.2	3.3
AH 2-1 Gas Diff.	13.5	13.5	12.8	12.8	12.8	12.5
AH 2-2 Gas Diff.	13.8	13.7	13.3	13.3	13.2	12.9
ID Fan 2-1 Inlet	-16.1	-16.4	-15.1	-15.3	-15.3	-15.4
ID Fan 2-2 Inlet	-16.5	-16.6	-15.6	-15.8	-15.6	-15.9
Atm. Barometric "Hg	24.4	24.4	24.6	24.5	24.5	24.5

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	213	214	215	216	217	218	219
Date	3/17/82	3/17/82	3/17/82	3/17/82	3/18/82	3/18/82	3/18/82
FLOWS, 10E3 LB/HR							
Air Flow	3478	3443	3256	3299	3292	3260	3335
Feedwater	3001	2953	2975	3009	2964	2877	3005
Main Steam	2932	2900	2901	2929	2891	2898	2912
Reheat Steam	-	-	-	-	-	-	-
Auxiliary Steam	41	40	41	40	40	39	39
Stm. AH Extr.	32	36	32	32	30	30	30
Stm. AH Aux.	0	0	0	0	0	0	0
Condensate Flow	2485	2446	2451	2523	2466	2429	2426
Superheat Spray L	0	0	0	0	0	54	0
Superheat Spray R	0	0	0	0	0	32	0
Reheat Spray	0	0	17	0	0	36	0
PRESSURES							
Steam & Water, Psig							
Boiler Drum	2686	2670	2672	2679	2669	2663	2673
Throttle Steam	2411	2395	2399	2404	2395	2395	2399
Turbine 1st Stage	1822	1809	1813	1816	1805	1807	1806
Turbine Cold Reheat	595	584	591	592	586	595	588
Reheat Inlet	549	538	544	546	540	549	543
Extr. Steam (HP-FW)	591	580	586	588	581	590	583
Main Steam	2438	2421	2425	2429	2424	2424	2425
Aux. Steam	346	347	348	346	346	345	347
Air & Gas, "H_2O							
FD Fan 2-1 Discharge	11.8	11.6	12.0	11.0	10.8	11.0	11.3
FD Fan 2-2 Discharge	11.7	11.4	12.0	11.0	10.8	10.9	11.2
AH 2-1 Air Diff.	3.5	3.5	3.2	3.2	3.2	3.3	3.3
AH 2-2 Air Diff.	3.6	3.6	3.3	3.2	3.2	3.3	3.3
Windbox Pressure L	4.6	4.6	5.0	5.0	4.7	4.7	4.7
Windbox Pressure R	4.7	4.8	5.0	5.0	4.9	4.8	4.9
WB/Furn. Diff. L	5.7	5.4	5.5	5.5	5.3	5.1	5.4
WB/Furn. Diff. R	5.4	5.6	5.5	5.5	5.7	5.3	5.8
Furnace Draft	-0.4	-0.5	-0.4	-0.6	-0.7	-0.5	-0.6
SH Draft Diff.	2.4	2.3	2.2	2.1	2.1	2.1	2.1
Econ. Draft Diff.	3.6	3.5	3.2	3.2	3.3	3.2	3.3
AH 2-1 Gas Diff.	13.9	13.5	13.1	12.5	12.4	12.3	12.7
AH 2-2 Gas Diff.	14.4	13.8	13.5	13.0	12.9	12.8	13.3
ID Fan 2-1 Inlet	-16.6	-16.6	-15.4	-15.3	-15.3	-15.0	-15.3
ID Fan 2-2 Inlet	-17.2	-16.9	-15.6	-15.7	-15.8	-15.8	-16.0
Atm. Barometric "Hg	24.5	24.5	24.5	24.5	24.3	24.3	24.3

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	220	221	222	223	224	225	226	227
Date	3/18/82	3/18/82	3/18/82	3/19/82	3/19/82	3/19/82	3/19/82	3/19/82
FLOWS, 10E3 LB/HR								
Air Flow	3256	3235	3323	3357	3449	3464	3508	3511
Feedwater	3052	2922	2843	2995	3031	2991	3023	3081
Main Steam	2954	2901	2908	2912	2914	2913	2925	2939
Reheat Steam	-	-	-	-	-	-	-	-
Auxiliary Steam	39	40	40	42	42	41	41	43
Stm. AH Extr.	32	37	38	40	39	41	41	41
Stm. AH Aux.	0	0	0	0	0	0	0	0
Condensate Flow	2493	2520	2468	2665	2615	2708	2694	2661
Superheat Spray L	0	27	78	0	17	35	29	0
Superheat Spray R	0	31	77	0	0	33	26	0
Reheat Spray	0	20	43	0	0	25	22	0
PRESSURES								
Steam & Water, Psig								
Boiler Drum	2684	2672	2663	2679	2677	2675	2666	2665
Throttle Steam	2410	2404	2400	2404	2403	2404	2395	2390
Turbine 1st Stage	1816	1812	1810	1814	1815	1816	1809	1804
Turbine Cold Reheat	591	593	599	591	590	592	589	584
Reheat Inlet	545	547	553	545	544	545	543	538
Extr. Steam (HP-FW)	586	588	595	587	586	589	585	579
Main Steam	2435	2431	2430	2430	2428	2430	2418	2417
Aux. Steam	344	345	350	349	349	346	345	349
Air & Gas, "H_2O								
FD Fan 2-1 Discharge	11.2	11.1	11.3	11.2	11.8	11.6	11.8	11.7
FD Fan 2-2 Discharge	11.0	11.9	11.2	11.1	11.7	11.5	11.7	11.6
AH 2-1 Air Diff.	3.3	3.4	3.3	3.5	3.8	3.6	3.6	3.6
AH 2-2 Air Diff.	3.3	3.4	3.3	3.3	3.6	3.5	3.7	3.8
Windbox Pressure L	4.9	4.7	4.7	4.7	4.6	4.6	4.5	4.5
Windbox Pressure R	5.0	4.9	4.8	4.8	4.8	4.8	4.7	4.7
WB/Furn. Diff. L	5.3	5.4	5.0	5.0	5.0	5.2	5.2	5.1
WB/Furn. Diff. R	5.6	5.8	5.3	5.3	5.4	5.5	5.6	5.5
Furnace Draft	-0.6	-0.6	-0.5	-0.5	-0.8	-0.8	-0.6	-0.5
SH Draft Diff.	2.1	2.2	2.2	2.2	2.3	2.4	2.5	2.5
Econ. Draft Diff.	3.2	3.3	3.4	3.3	3.5	3.5	3.6	3.6
AH 2-1 Gas Diff.	12.3	12.8	13.1	12.6	13.7	13.7	13.8	13.7
AH 2-2 Gas Diff.	12.8	13.5	13.5	13.3	14.3	14.7	14.9	14.9
ID Fan 2-1 Inlet	-15.4	-15.8	-16.1	-15.7	-16.7	-16.3	-16.6	-16.5
ID Fan 2-2 Inlet	-15.6	-16.3	-16.5	-16.3	-17.2	-17.9	-18.2	-18.1
Atm. Barometric "Hg	24.3	24.3	24.3	24.6	24.5	24.5	24.6	24.6

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	228	229	230	231	232	233	234	235
Test Date	3/19/82	3/22/82	3/22/82	3/22/82	3/22/82	3/22/82	3/22/82	3/22/82
FLOWS, 10E3 LB/HR								
Air Flow	3464	3285	3306	3291	3316	3205	3194	3236
Feedwater	3191	2989	2924	3060	3018	2897	2875	3015
Main Steam	2985	2892	2895	2909	2887	2904	2895	2898
Reheat Steam	-	-	-	-	-	-	-	-
Auxiliary Steam	48	41	44	40	41	40	40	40
Stm. AH Extr.	33	37	32	33	31	30	27	28
Stm. AH Aux.	16	0	0	0	0	0	0	0
Condensate Flow	-	2560	2459	2503	2479	2469	2553	2538
Superheat Spray L	0	20	46	0	0	65	80	0
Superheat Spray R	0	16	54	0	0	54	74	0
Reheat Spray	0	26	23	0	0	35	34	0
PRESSURES								
Steam & Water, Psig								
Boiler Drum	2680	2659	2683	2676	2673	2678	2663	2677
Throttle Steam	2401	2392	2415	2400	2399	2413	2401	2405
Turbine 1st Stage	1811	1796	1814	1804	1803	1814	1806	1807
Turbine Cold Reheat	591	588	592	585	586	597	596	586
Reheat Inlet	545	542	545	538	540	550	550	540
Extr. Steam (HP-FW)	586	583	588	579	581	592	592	581
Main Steam	2429	2415	2441	2425	2425	2438	2425	2429
Aux. Steam	348	348	349	347	350	348	346	347
Air & Gas, "H_2O								
FD Fan 2-1 Discharge	12.0	11.3	11.2	10.8	11.0	11.0	11.0	9.9
FD Fan 2-2 Discharge	12.0	11.2	11.1	10.7	10.8	10.9	10.9	9.7
AH 2-1 Air Diff.	3.6	3.4	3.3	3.2	3.4	3.4	3.3	3.3
AH 2-2 Air Diff.	3.6	3.4	3.3	3.3	3.4	3.4	3.4	3.2
Windbox Pressure L	5.0	4.7	4.7	4.6	4.8	4.7	4.9	3.0
Windbox Pressure R	5.0	4.8	4.9	4.8	5.0	4.8	5.1	3.2
WB/Furn. Diff. L	5.0	5.3	5.3	5.1	5.2	5.1	5.3	3.5
WB/Furn. Diff. R	5.1	5.6	5.5	5.6	5.6	5.4	5.7	3.9
Furnace Draft	-0.3	-0.3	-0.4	-0.4	-0.4	-0.3	-0.6	-0.6
SH Draft Diff.	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2
Econ. Draft Diff.	3.6	3.3	3.2	3.2	3.3	3.2	3.2	3.2
AH 2-1 Gas Diff.	13.8	13.8	13.5	13.2	13.4	13.3	13.4	13.6
AH 2-2 Gas Diff.	15.0	13.0	12.8	12.5	12.7	12.7	12.6	12.9
ID Fan 2-1 Inlet	-16.2	-16.3	-16.0	-16.4	-16.6	-16.1	-16.0	-16.2
ID Fan 2-2 Inlet	-17.8	-15.1	-15.0	-15.2	-15.4	-15.1	-14.9	-15.0
Atm. Barometric "Hg	24.6	24.7	24.7	24.7	24.7	24.7	24.7	24.6

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	236	237	238	239	240	241	242
Date	3/23/82	3/23/82	3/23/82	3/23/82	3/23/82	3/23/82	3/23/82
FLOWS, 10E3 LB/HR							
Air Flow	3196	3359	3336	3279	3214	3285	3249
Feedwater	2889	2977	2971	3021	3042	2935	2907
Main Steam	2852	2903	2877	2927	2940	2924	2894
Reheat Steam	-	-	-	-	-	-	-
Auxiliary Steam	41	41	41	41	41	41	41
Stm. AH Extr.	33	32	27	25	26	25	27
Stm. AH Aux.	0	0	0	0	0	0	0
Condensate Flow	2427	2491	2434	2433	2477	2404	2479
Superheat Spray L	50	21	0	0	0	27	45
Superheat Spray R	35	0	0	0	0	20	49
Reheat Spray	36	0	0	0	0	0	42
PRESSURES							
Steam & Water, Psig							
Boiler Drum	2653	2676	2660	2677	2681	2680	2656
Throttle Steam	2391	2408	2391	2406	2410	2408	2387
Turbine 1st Stage	1788	1801	1788	1799	1803	1819	1804
Turbine Cold Reheat	585	588	581	580	588	594	595
Reheat Inlet	539	541	536	540	541	548	549
Extr. Steam (HP-FW)	580	582	577	582	583	590	591
Main Steam	2415	2433	2415	2430	2434	2433	2411
Aux. Steam	350	347	350	348	351	347	346
Air & Gas, "H_2O							
FD Fan 2-1 Discharge	10.4	11.2	11.2	10.8	11.1	11.7	11.0
FD Fan 2-2 Discharge	10.4	11.2	11.0	10.7	10.9	11.0	10.9
AH 2-1 Air Diff.	3.2	3.5	3.4	3.3	3.2	3.3	3.4
AH 2-2 Air Diff.	3.5	4.0	3.8	3.7	3.5	3.8	3.9
Windbox Pressure L	4.7	4.7	4.7	4.6	4.7	4.9	4.8
Windbox Pressure R	4.8	4.8	4.8	4.7	4.9	4.8	4.7
WB/Furn. Diff. L	5.3	5.3	5.1	5.2	5.2	5.3	5.4
WB/Furn. Diff. R	5.6	5.6	5.4	5.5	5.7	5.4	5.5
Furnace Draft	-0.5	-0.6	-0.5	-0.5	-0.5	-0.6	-0.3
SH Draft Diff.	2.1	2.2	2.3	2.2	2.1	2.2	2.2
Econ. Draft Diff.	3.3	3.3	3.4	3.3	3.2	3.3	3.3
AH 2-1 Gas Diff.	12.3	13.8	13.6	13.4	13.5	13.6	13.7
AH 2-2 Gas Diff.	12.1	13.1	12.9	12.6	12.7	12.8	13.1
ID Fan 2-1 Inlet	-15.9	-17.0	-17.2	-16.3	-16.0	-16.7	-16.5
ID Fan 2-2 Inlet	-14.9	-15.8	-15.8	-15.2	-15.0	-15.5	-15.2
Atm. Barometric "Hg	24.7	24.6	24.6	24.6	24.6	24.6	24.6

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	243	244	245	246	247	248	249
Date	3/24/82	3/24/82	3/24/82	3/24/82	3/24/82	3/24/82	3/24/82
FLOWS, 10E3 LB/HR							
Air Flow	3210	3067	3035	3117	3067	3055	3128
Feedwater	2902	2822	2901	2807	2834	2886	2906
Main Steam	2846	2837	2864	2829	2838	2855	2855
Reheat Steam	-	-	-	-	-	-	-
Auxiliary Steam	40	40	40	40	40	39	40
Stm. AH Extr.	23	22	21	25	19	20	23
Stm. AH Aux.	0	0	0	0	0	0	0
Condensate Flow	2459	2512	2482	2420	2472	2514	2488
Superheat Spray L	32	79	45	76	81	62	41
Superheat Spray R	31	58	33	53	57	35	18
Reheat Spray	25	26	31	44	42	28	28
PRESSURES							
Steam & Water, Psig							
Boiler Drum	2664	2659	2662	2650	2653	2666	2664
Throttle Steam	2406	2405	2404	2400	2401	2410	2406
Turbine 1st Stage	1764	1764	1764	1758	1759	1767	1764
Turbine Cold Reheat	578	579	580	579	581	581	580
Reheat Inlet	532	533	535	534	536	536	535
Extr. Steam (HP-FW)	573	574	575	575	576	576	575
Main Steam	2429	2430	2428	2422	2423	2433	2430
Aux. Steam	345	347	345	349	346	345	348
Air & Gas, "H_2O							
FD Fan 2-1 Discharge	11.5	10.4	10.4	10.7	10.7	10.4	10.2
FD Fan 2-2 Discharge	11.5	10.4	10.4	10.6	10.7	10.3	10.1
AH 2-1 Air Diff.	3.2	3.1	3.1	3.0	3.1	2.9	3.0
AH 2-2 Air Diff.	4.1	3.9	3.8	3.9	4.0	3.8	3.9
Windbox Pressure L	4.7	4.7	4.8	4.9	4.9	4.8	4.6
Windbox Pressure R	4.7	4.8	4.8	5.0	5.1	5.0	4.8
WB/Furn. Diff. L	5.3	5.3	5.4	5.2	5.2	5.2	5.1
WB/Furn. Diff. R	5.5	5.6	5.6	5.5	5.6	5.6	5.4
Furnace Draft	-0.6	-0.5	-0.8	-0.3	-0.6	-0.6	-0.6
SH Draft Diff.	2.0	2.0	2.0	1.9	1.9	2.0	1.9
Econ. Draft Diff.	3.0	3.0	3.0	2.9	3.0	2.9	3.0
AH 2-1 Gas Diff.	12.0	12.3	12.4	12.5	12.6	12.6	12.4
AH 2-2 Gas Diff.	12.5	11.7	12.3	11.7	12.1	11.9	11.7
ID Fan 2-1 Inlet	-15.5	-15.0	-15.2	-14.7	-15.2	-14.8	-14.7
ID Fan 2-2 Inlet	-14.4	-14.0	-14.1	-13.6	-14.2	-13.8	-13.8
Atm. Barometric "Hg	24.6	24.6	24.6	24.6	24.6	24.6	24.6

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	250	251	252	253	254	255	256	257
Test Date	*	*	*	*	**	*	*	*
FLOWS, 10E3 LB/HR								
Air Flow					2840			
Feedwater					2859			
Main Steam					-			
Reheat Steam					41			
Auxiliary Steam					44			
Stm. AH Extr.					0			
Stm. AH Aux.					2415			
Condensate Flow					74			
Superheat Spray L					65			
Superheat Spray R					0			
Reheat Spray								
PRESSURES								
Steam & Water, Psig								
Boiler Drum					2659			
Throttle Steam					2405			
Turbine 1st Stage					1766			
Turbine Cold Reheat					579			
Reheat Inlet					534			
Extr. Steam (HP-FW)					575			
Main Steam					2428			
Aux. Steam					346			
Air & Gas, "H_2O								
FD Fan 2-1 Discharge								
FD Fan 2-2 Discharge								
AH 2-1 Air Diff.					3.2			
AH 2-2 Air Diff.					4.4			
Windbox Pressure L								
Windbox Pressure R								
WB/Furn. Diff. L								
WB/Furn. Diff. R								
Furnace Draft					-0.6			
SH Draft Diff.					2.1			
Econ. Draft Diff.					3.1			
AH 2-1 Gas Diff.								
AH 2-2 Gas Diff.								
ID Fan 2-1 Inlet					-16			
ID Fan 2-2 Inlet					-15			
Atm. Barometric "Hg					24.34			

* Only Board and Emissions Data Available

** Only Board, Emissions and Limited Computer Data Available

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	258	259	260	261	262	263	264	265
Test Date	*	*	*	*	*	*	3/30/82	3/30/82
							**	**
FLOWS, 10E3 LB/HR								
Air Flow							3241	3193
Feedwater							-	2883
Main Steam							2848	2862
Reheat Steam							-	-
Auxiliary Steam							41	43
Stm. AH Extr.							34	34
Stm. AH Aux.							0	0
Condensate Flow							2535	2472
Superheat Spray L							85	73
Superheat Spray R							77	55
Reheat Spray							56	53
PRESSURES								
Steam & Water, Psig								
Boiler Drum							2652	2656
Throttle Steam							2400	2400
Turbine 1st Stage							1767	1768
Turbine Cold Reheat							588	589
Reheat Inlet							543	544
Extr. Steam (HP-FW)							584	584
Main Steam							2422	2423
Aux. Steam							346	349
Air & Gas, "H_2O								
FD Fan 2-1 Discharge								
FD Fan 2-2 Discharge								
AH 2-1 Air Diff.							3.3	3.3
AH 2-2 Air Diff.							4.5	4.3
Windbox Pressure L								
Windbox Pressure R								
WB/Furn. Diff. L								
WB/Furn. Diff. R								
Furnace Draft							-0.6	-0.4
SH Draft Diff.							2.1	2.2
Econ. Draft Diff.							3.2	3.2
AH 2-1 Gas Diff.								
AH 2-2 Gas Diff.								
ID Fan 2-1 Inlet							-16	-16
ID Fan 2-2 Inlet							-15	-15
Atm. Barometric "Hg							24.61	24.61

* Only Board and Emissions Data Available

** Only Board, Emissions and Limited Computer Data Available

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	266	267	268	269
Test Date	*	*	3/31/82 **	3/31/82 **
FLOWS, 10E3 LB/HR				
Air Flow			3329	3308
Feedwater			2910	2918
Main Steam			2885	2887
Reheat Steam			-	-
Auxiliary Steam			41	40
Stm. AH Extr.			18	18
Stm. AH Aux.			0	0
Condensate Flow			2885	2522
Superheat Spray L			41	63
Superheat Spray R			18	33
Reheat Spray			52	55
PRESSURES				
Steam & Water, Psig				
Boiler Drum			2671	2674
Throttle Steam			2408	2411
Turbine 1st Stage			1788	1790
Turbine Cold Reheat			591	593
Reheat Inlet			547	548
Extr. Steam (HP-FW)			586	588
Main Steam			2430	2434
Aux. Steam			346	348
Air & Gas, "H_2O				
FD Fan 2-1 Discharge				
FD Fan 2-2 Discharge				
AH 2-1 Air Diff.			3.4	3.3
AH 2-2 Air Diff.			4.5	4.5
Windbox Pressure L				
Windbox Pressure R				
WB/Furn. Diff. L				
WB/Furn. Diff. R				
Furnace Draft			-0.6	-0.5
SH Draft Diff.			2.1	2.1
Econ. Draft Diff.			3.3	3.2
AH 2-1 Gas Diff.				
AH 2-2 Gas Diff.				
ID Fan 2-1 Inlet			-17	-16
ID Fan 2-2 Inlet			-15	-15
Atm. Barometric "Hg			24.55	24.55

* Only Board and Emissions Data Available

** Only Board, Emissions and Limited Computer Data Available

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	201	202	203	204	205	206
Date	3/16/82	3/16/82	3/16/82	3/16/82	3/16/82	3/16/82
FAN DAMPER, % Open						
FD Fan 2-1 Inlet	70	70	70	70	68	67
FD Fan 2-1 Outlet	100	100	100	100	100	100
FD Fan 2-2 Inlet	70	70	71	71	69	68
FD Fan 2-2 Outlet	100	100	100	100	100	100
ID Fan 2-1 Inlet	80	83	83	83	83	80
ID Fan 2-1 Outlet	100	100	100	100	100	100
ID Fan 2-2 Inlet	80	80	80	80	80	77
ID Fan 2-2 Outlet	100	100	100	100	100	100
SPRAY VALVES, % Open						
SH Spray L	0	0	0	0	0	0
SH Spray R	0	0	0	0	0	0
RH Spray	0	0	0	0	0	0
MILL DATA						
Coal Flow 2-1 10E3 LB/HR	69	69	70	68	69	69
Coal Flow 2-2	70	70	71	68	70	69
Coal Flow 2-3	70	70	71	69	70	69
Coal Flow 2-4	70	70	71	69	70	69
Coal Flow 2-5	71	71	72	69	71	70
Coal Air Temp. 2-1, °F	163	163	163	164	162	162
Coal Air Temp. 2-2	164	165	164	165	164	163
Coal Air Temp. 2-3	164	164	164	164	164	162
Coal Air Temp. 2-4	165	165	165	165	165	162
Coal Air Temp. 2-5	164	165	165	165	165	163
Mill 2-1 Amps	73	72	72	72	72	72
Mill 2-2	72	72	71	70	71	71
Mill 2-3	72	73	71	71	72	72
Mill 2-4	76	76	77	74	75	75
Mill 2-5	74	73	73	74	74	74
Exh. Discharge "H_2O						
Mill 2-1	8.0	8.2	8.2	8.2	8.3	8.2
Mill 2-2	8.2	8.2	8.2	8.2	8.3	7.2
Mill 2-3	8.0	7.8	8.0	8.0	7.8	7.8
Mill 2-4	8.0	7.8	7.7	7.7	7.7	7.8
Mill 2-5	8.0	6.8	7.0	7.0	6.8	6.7
Diff. Press. 2-1 "H_2O	7.5	7.7	7.8	7.8	7.7	7.7
Diff. Press. 2-2	5.5	5.7	5.7	5.7	5.7	5.6
Diff. Press. 2-3	6.0	6.0	6.0	6.0	6.0	5.8
Diff. Press. 2-4	7.0	7.2	7.1	7.1	7.0	7.0
Diff. Press. 2-5	6.5	6.7	6.6	6.6	6.7	6.6
Mill 2-1 Suction	-1.5	-1.0	-1.3	-1.3	-1.3	-1.4
Mill 2-2 Suction	-2.0	-2.0	-2.3	-2.3	-2.1	-2.2
Mill 2-3 Suction	-2.0	-2.0	-2.2	-2.2	-2.0	-2.2
Mill 2-4 Suction	-1.5	-1.5	-1.7	-1.7	-1.8	-2.0
Mill 2-5 Suction	-1.5	-1.5	-1.7	-1.7	-1.7	-1.8
Mill 2-1 Feeder Speed % Full	80	83	80	80	78	77
Mill 2-2 Feeder Speed	80	82	80	80	79	78
Mill 2-3 Feeder Speed	80	83	81	80	80	78
Mill 2-4 Feeder Speed	80	83	81	80	80	78
Mill 2-5 Feeder Speed	80	84	82	80	80	78

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	207	208	209	210	211	212
Date	3/16/82	3/16/82	3/17/82	3/17/82	3/17/82	3/17/82
FAN DAMPER, % Open						
FD Fan 2-1 Inlet	69	70	68	68	68	67
FD Fan 2-1 Outlet	100	100	100	100	100	100
FD Fan 2-2 Inlet	70	70	69	69	68	68
FD Fan 2-2 Outlet	100	100	100	100	100	100
ID Fan 2-1 Inlet	83	83	83	83	83	80
ID Fan 2-1 Outlet	100	100	100	100	100	100
ID Fan 2-2 Inlet	81	81	80	80	79	77
ID Fan 2-2 Outlet	100	100	100	100	100	100
SPRAY VALVES, % Open						
SH Spray L	0	0	0	5	0	0
SH Spray R	0	0	0	5	0	0
RH Spray	0	0	10	10	0	0
MILL DATA						
Coal Flow 2-1 10E3 LB/HR	68	70	71	71	70	69
Coal Flow 2-2	69	70	71	71	70	70
Coal Flow 2-3	69	71	72	71	71	70
Coal Flow 2-4	69	70	72	71	71	70
Coal Flow 2-5	70	71	72	71	70	70
Coal Air Temp. 2-1, °F	166	163	-	164	163	163
Coal Air Temp. 2-2	166	165	166	165	166	165
Coal Air Temp. 2-3	166	164	164	163	164	163
Coal Air Temp. 2-4	168	165	165	165	164	164
Coal Air Temp. 2-5	166	164	165	164	164	164
Mill 2-1 Amps	71	73	73	72	73	73
Mill 2-2	72	71	71	70	70	70
Mill 2-3	72	72	73	72	71	73
Mill 2-4	75	76	77	77	76	78
Mill 2-5	75	76	75	74	74	74
Exh. Discharge "H_2O						
Mill 2-1	8.2	8.2	8.3	8.0	8.3	8.2
Mill 2-2	7.6	8.3	8.3	8.0	8.2	8.0
Mill 2-3	7.8	8.0	8.0	7.8	7.8	8.0
Mill 2-4	7.8	7.8	7.8	7.6	7.6	7.5
Mill 2-5	6.8	7.0	6.8	7.0	6.8	6.8
Diff. Press. 2-1 "H_2O	7.7	7.6	7.8	7.7	7.8	7.7
Diff. Press. 2-2	5.7	5.7	5.7	5.6	5.6	5.6
Diff. Press. 2-3	5.9	5.8	6.0	6.0	6.0	6.0
Diff. Press. 2-4	7.0	7.0	6.9	7.2	7.2	7.0
Diff. Press. 2-5	6.6	6.6	6.7	6.7	6.7	6.1
Mill 2-1 Suction	-1.3	-1.3	-1.3	-1.3	-1.2	-1.3
Mill 2-2 Suction	-2.1	-2.2	-2.2	-2.2	-2.2	-2.1
Mill 2-3 Suction	-2.2	-2.1	-2.1	-2.1	-2.0	-2.1
Mill 2-4 Suction	-1.9	-1.9	-1.7	-1.7	-1.6	-1.7
Mill 2-5 Suction	-1.7	-1.7	-1.7	-1.7	-1.6	-1.7
Mill 2-1 Feeder Speed % Full	78	78	78	82	80	79
Mill 2-2 Feeder Speed	79	79	79	83	81	80
Mill 2-3 Feeder Speed	80	80	81	84	82	80
Mill 2-4 Feeder Speed	80	80	80	84	81	81
Mill 2-5 Feeder Speed	81	81	81	85	81	81

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	213	214	215	216	217	218	219
Date	3/17/82	3/17/82	3/17/82	3/17/82	3/18/82	3/18/82	3/18/82
FAN DAMPER, % Open							
FD Fan 2-1 Inlet	71	71	-	70	68	68	68
FD Fan 2-1 Outlet	100	100	100	100	100	100	100
FD Fan 2-2 Inlet	72	71	68	70	69	69	69
FD Fan 2-2 Outlet	100	100	100	100	100	100	100
ID Fan 2-1 Inlet	84	83	78	82	81	77	83
ID Fan 2-1 Outlet	100	100	100	100	100	100	100
ID Fan 2-2 Inlet	82	80	78	80	78	76	79
ID Fan 2-2 Outlet	100	100	100	100	100	100	100
SPRAY VALVES, % Open							
SH Spray L	0	0	0	0	-	25	0
SH Spray R	0	0	0	0	-	30	0
RH Spray	2	0	8	2	-	20	0
MILL DATA							
Coal Flow 2-1 10E3 LB/HR	70	70	71	69	72	73	71
Coal Flow 2-2	70	71	72	70	73	74	72
Coal Flow 2-3	70	71	72	70	73	75	71
Coal Flow 2-4	69	71	72	70	68	70	67
Coal Flow 2-5	70	71	72	70	73	74	72
Coal Air Temp. 2-1, °F	164	163	164	163	164	164	163
Coal Air Temp. 2-2	165	165	164	165	164	164	164
Coal Air Temp. 2-3	164	163	164	163	163	164	163
Coal Air Temp. 2-4	165	165	165	165	165	164	165
Coal Air Temp. 2-5	165	164	165	164	165	165	165
Mill 2-1 Amps	73	74	73	73	73	73	74
Mill 2-2	72	70	73	71	71	71	72
Mill 2-3	74	73	71	71	73	72	73
Mill 2-4	77	77	78	76	77	77	77
Mill 2-5	75	74	75	73	77	74	74
Exh. Discharge "H_2O							
Mill 2-1	8.3	9.3	8.3	8.0	8.0	8.6	8.3
Mill 2-2	8.3	8.2	8.0	8.5	7.8	8.2	8.2
Mill 2-3	7.8	7.8	8.0	8.0	7.8	8.0	7.8
Mill 2-4	7.8	7.6	8.0	7.5	7.5	7.6	7.8
Mill 2-5	8.0	6.8	8.0	7.0	7.3	7.2	7.2
Diff. Press. 2-1 "H_2O	7.8	7.8	8.0	7.5	7.7	7.7	7.7
Diff. Press. 2-2	5.7	5.7	5.5	5.5	5.7	6.0	5.7
Diff. Press. 2-3	6.1	6.1	6.0	6.0	6.0	6.1	6.0
Diff. Press. 2-4	7.3	7.3	7.0	7.5	7.5	7.3	7.1
Diff. Press. 2-5	6.7	6.7	6.5	6.5	6.6	6.6	6.6
Mill 2-1 Suction	-1.2	-1.2	-1.0	-1.0	-1.2	-1.2	-1.2
Mill 2-2 Suction	-2.1	-2.0	-2.0	-2.0	-1.9	-2.0	-2.1
Mill 2-3 Suction	-2.0	-2.0	-2.0	-2.0	-2.0	-1.9	-2.0
Mill 2-4 Suction	-1.7	-1.5	-1.5	-1.5	-1.7	-1.7	-1.7
Mill 2-5 Suction	-1.7	-1.7	-1.5	-1.5	-1.6	-1.6	-1.6
Mill 2-1 Feeder Speed % Full	80	82	82	80	81	83	82
Mill 2-2 Feeder Speed	80	82	82	81	81	84	82
Mill 2-3 Feeder Speed	81	83	82	82	82	84	83
Mill 2-4 Feeder Speed	81	83	82	81	78	79	78
Mill 2-5 Feeder Speed	80	82	83	81	83	85	83

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	220	221	222	223	224	225	226	227
Date	3/18/82	3/18/82	3/18/82	3/19/82	3/19/82	3/19/82	3/19/82	3/19/82
FAN DAMPER, % Open								
FD Fan 2-1 Inlet	68	88	68	68	71	70	71	71
FD Fan 2-1 Outlet	100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet	68	68	69	68	71	71	72	73
FD Fan 2-2 Outlet	100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet	78	81	80	79	84	83	82	82
ID Fan 2-1 Outlet	100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet	76	78	77	77	81	83	83	83
ID Fan 2-2 Outlet	100	100	100	100	100	100	100	100
SPRAY VALVES, % Open								
SH Spray L	0	10	28	0	0	12	10	0
SH Spray R	0	27	40	0	0	25	25	0
RH Spray	0	10	30	0	0	12	5	0
MILL DATA								
Coal Flow 2-1 10E3 LB/HR	71	72	74	71	73	71	72	72
Coal Flow 2-2	71	73	74	72	73	72	73	73
Coal Flow 2-3	72	73	75	72	73	68	72	73
Coal Flow 2-4	67	68	70	68	69	72	69	68
Coal Flow 2-5	72	72	74	72	73	72	73	73
Coal Air Temp. 2-1, °F	163	163	163	164	164	163	163	163
Coal Air Temp. 2-2	164	164	164	163	164	164	164	164
Coal Air Temp. 2-3	163	162	163	163	163	165	162	163
Coal Air Temp. 2-4	165	165	165	164	165	165	165	164
Coal Air Temp. 2-5	165	165	164	165	165	165	165	163
Mill 2-1 Amps	74	74	75	73	74	74	75	74
Mill 2-2	72	72	72	73	72	75	73	73
Mill 2-3	73	73	74	72	73	73	75	72
Mill 2-4	75	75	78	75	76	79	77	77
Mill 2-5	77	75	78	75	75	75	77	75
Exh. Discharge "H_2O								
Mill 2-1	8.3	8.2	8.6	8.2	8.2	8.2	8.4	8.5
Mill 2-2	8.1	8.0	7.8	8.2	7.0	7.7	7.2	7.2
Mill 2-3	7.8	7.8	7.6	7.8	7.8	7.7	7.8	7.7
Mill 2-4	8.2	7.8	7.7	7.8	8.2	7.8	7.7	7.8
Mill 2-5	7.2	7.0	6.6	7.0	7.0	7.2	7.2	7.2
Diff. Press. 2-1 "H_2O	7.7	7.8	7.8	7.8	7.8	7.8	7.7	7.7
Diff. Press. 2-2	5.6	5.7	5.8	6.0	5.8	5.7	5.7	5.7
Diff. Press. 2-3	6.0	6.2	6.2	6.2	6.2	6.0	6.0	6.0
Diff. Press. 2-4	6.8	7.2	7.0	7.0	7.0	7.7	7.2	7.0
Diff. Press. 2-5	6.4	7.0	6.7	6.7	6.7	6.7	6.7	6.7
Mill 2-1 Suction	-1.2	-1.2	-1.1	-1.2	-1.3	-1.2	-1.2	-1.2
Mill 2-2 Suction	-2.1	-2.1	-2.2	-2.0	-2.1	-2.1	-2.2	-2.2
Mill 2-3 Suction	-2.2	-2.2	-2.1	-2.1	-2.1	-2.3	-2.1	-2.0
Mill 2-4 Suction	-1.7	-1.7	-1.7	-1.6	-1.7	-1.8	-1.8	-1.8
Mill 2-5 Suction	-1.6	-1.6	-1.6	-1.7	-1.7	-1.7	-1.7	-1.7
Mill 2-1 Feeder Speed % Full	82	83	84	82	83	82	81	81
Mill 2-2 Feeder Speed	82	83	86	82	83	82	82	81
Mill 2-3 Feeder Speed	82	84	86	83	83	78	82	81
Mill 2-4 Feeder Speed	78	79	80	78	78	82	78	71
Mill 2-5 Feeder Speed	83	85	87	84	84	83	83	82

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	228	229	230	231	232	233	234	235
Date	3/19/82	3/22/82	3/22/82	3/22/82	3/22/82	3/22/82	3/22/82	3/22/82
FAN DAMPER, % Open								
FD Fan 2-1 Inlet	71	69	68	68	68	67	67	67
FD Fan 2-1 Outlet	100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet	71	69	69	68	69	68	68	67
FD Fan 2-2 Outlet	100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet	82	84	83	80	83	81	82	82
ID Fan 2-1 Outlet	100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet	82	77	77	74	77	75	76	75
ID Fan 2-2 Outlet	100	100	100	100	100	100	100	100
SPRAY VALVES, % Open								
SH Spray L	0	0	0	0	0	24	30	0
SH Spray R	0	0	10	0	0	31	40	0
RH Spray	0	10	10	0	10	20	25	0
MILL DATA								
Coal Flow 2-1 10E3 LB/HR	72	73	70	70	71	70	71	72
Coal Flow 2-2	72	74	71	71	71	71	72	72
Coal Flow 2-3	72	74	71	71	72	71	73	73
Coal Flow 2-4	68	70	67	67	68	67	68	69
Coal Flow 2-5	72	74	71	71	71	71	72	71
Coal Air Temp. 2-1, °F	164	164	164	164	164	164	164	164
Coal Air Temp. 2-2	165	164	165	164	164	164	164	163
Coal Air Temp. 2-3	163	163	164	163	163	164	163	162
Coal Air Temp. 2-4	165	165	166	165	164	165	164	163
Coal Air Temp. 2-5	164	164	165	165	165	164	164	164
Mill 2-1 Amps	73	74	74	73	74	73	74	73
Mill 2-2	71	72	71	71	71	72	71	73
Mill 2-3	71	72	73	73	73	72	72	74
Mill 2-4	76	77	76	77	77	78	78	77
Mill 2-5	75	73	73	74	75	75	75	76
Exh. Discharge "H_2O								
Mill 2-1	8.5	8.4	8.7	8.3	8.5	8.4	8.2	8.3
Mill 2-2	7.0	8.0	8.0	8.2	8.2	8.2	7.5	7.5
Mill 2-3	7.8	7.8	7.8	8.0	8.0	7.8	7.8	7.9
Mill 2-4	8.0	7.8	8.0	7.8	7.8	7.7	7.8	7.8
Mill 2-5	8.0	7.2	7.0	7.2	7.0	7.0	7.2	7.2
Diff. Press. 2-1 "H_2O	7.6	7.9	7.8	7.8	7.8	7.8	7.8	7.7
Diff. Press. 2-2	5.7	6.0	5.8	5.7	5.8	5.8	5.8	5.7
Diff. Press. 2-3	6.0	6.0	6.2	6.0	6.0	6.0	6.0	6.0
Diff. Press. 2-4	6.5	7.7	7.3	7.5	7.2	7.4	7.5	7.4
Diff. Press. 2-5	6.5	6.7	6.7	6.7	6.6	6.7	6.7	6.7
Mill 2-1 Suction	-1.2	-1.2	-1.2	-1.2	-1.2	-1.3	-1.3	-1.4
Mill 2-2 Suction	-2.2	-1.7	-2.1	-2.1	-2.1	-2.1	-2.1	-2.3
Mill 2-3 Suction	-2.0	-2.0	-2.0	-2.1	-2.1	-2.1	-2.1	-2.2
Mill 2-4 Suction	-1.5	-1.7	-1.8	-1.9	-1.8	-1.9	-1.8	-2.0
Mill 2-5 Suction	-1.5	-1.6	-1.7	-1.7	-1.7	-1.7	-1.7	-1.8
Mill 2-1 Feeder Speed % Full	70	80	84	83	82	80	83	82
Mill 2-2 Feeder Speed	80	82	84	83	82	81	84	82
Mill 2-3 Feeder Speed	72	83	85	83	83	82	84	83
Mill 2-4 Feeder Speed	68	78	79	78	78	78	80	78
Mill 2-5 Feeder Speed	72	82	85	84	82	82	85	83

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	236	237	238	239	240	241	242
Date	3/23/82	3/23/82	3/23/82	3/23/82	3/23/82	3/23/82	3/23/82
FAN DAMPER, % Open							
FD Fan 2-1 Inlet	66	69	68	67	68	68	68
FD Fan 2-1 Outlet	100	100	100	100	100	100	100
FD Fan 2-2 Inlet	67	69	69	68	69	69	69
FD Fan 2-2 Outlet	100	100	100	100	100	100	100
ID Fan 2-1 Inlet	78	83	81	81	84	82	84
ID Fan 2-1 Outlet	100	100	100	100	100	100	100
ID Fan 2-2 Inlet	72	76	74	75	77	75	77
ID Fan 2-2 Outlet	100	100	100	100	100	100	100
SPRAY VALVES, % Open							
SH Spray L	23	0	0	0	0	10	18
SH Spray R	30	0	0	0	0	20	32
RH Spray	30	5	0	0	0	26	28
MILL DATA							
Coal Flow 2-1 10E3 LB/HR	70	68	70	68	67	69	71
Coal Flow 2-2	71	69	71	69	68	70	72
Coal Flow 2-3	71	69	71	69	68	70	73
Coal Flow 2-4	68	66	67	65	64	66	68
Coal Flow 2-5	71	69	71	69	68	69	72
Coal Air Temp. 2-1, °F	164	164	163	164	164	164	164
Coal Air Temp. 2-2	163	164	164	165	165	164	164
Coal Air Temp. 2-3	162	163	163	163	163	163	163
Coal Air Temp. 2-4	164	165	164	165	165	164	165
Coal Air Temp. 2-5	161	161	162	161	162	163	164
Mill 2-1 Amps	73	73	73	74	74	74	74
Mill 2-2	71	72	72	71	70	71	72
Mill 2-3	73	73	72	73	72	73	73
Mill 2-4	76	75	75	74	75	75	77
Mill 2-5	76	76	75	75	74	75	77
Exh. Discharge "H_2O							
Mill 2-1	8.2	8.2	8.4	8.2	8.2	8.2	8.0
Mill 2-2	8.0	8.0	8.0	8.2	8.2	8.0	8.0
Mill 2-3	7.7	8.0	7.8	7.8	8.0	7.9	7.8
Mill 2-4	7.3	7.6	7.5	7.5	7.3	7.3	7.2
Mill 2-5	7.0	7.2	7.0	7.0	7.2	7.2	7.2
Diff. Press. 2-1 "H_2O	7.7	7.6	7.7	7.6	7.5	7.6	7.8
Diff. Press. 2-2	5.7	5.6	5.7	5.6	5.7	5.7	5.7
Diff. Press. 2-3	5.9	6.0	5.9	5.8	5.8	6.0	6.0
Diff. Press. 2-4	7.2	7.2	6.9	7.0	7.0	7.3	7.5
Diff. Press. 2-5	6.2	6.7	6.7	6.6	6.6	6.7	6.7
Mill 2-1 Suction	-1.3	-1.3	-1.4	-1.3	-1.4	-1.3	-1.3
Mill 2-2 Suction	-2.2	-2.1	-2.2	-2.1	-2.3	-2.3	-2.2
Mill 2-3 Suction	-2.1	-2.1	-2.1	-2.1	-2.2	-2.2	-2.1
Mill 2-4 Suction	-1.8	-1.9	-1.9	-1.9	-2.0	-1.8	-1.8
Mill 2-5 Suction	-1.7	-1.8	-1.8	-1.8	-1.8	-1.7	-1.7
Mill 2-1 Feeder Speed % Full	80	78	78	78	77	80	80
Mill 2-2 Feeder Speed	81	78	79	79	78	81	81
Mill 2-3 Feeder Speed	81	79	80	79	79	81	81
Mill 2-4 Feeder Speed	79	76	75	75	74	77	76
Mill 2-5 Feeder Speed	82	79	80	80	79	81	81

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	243	244	245	246	247	248	249
Date	3/24/82	3/24/82	3/24/82	3/24/82	3/24/82	3/24/82	3/24/82
FAN DAMPER, % Open							
FD Fan 2-1 Inlet	70	66	67	67	67	66	67
FD Fan 2-1 Outlet	100	100	100	100	100	100	100
FD Fan 2-2 Inlet	70	68	67	67	67	67	67
FD Fan 2-2 Outlet	100	100	100	100	100	100	100
ID Fan 2-1 Inlet	83	79	82	82	79	81	81
ID Fan 2-1 Outlet	100	100	100	100	100	100	100
ID Fan 2-2 Inlet	77	73	77	75	74	75	75
ID Fan 2-2 Outlet	100	100	100	100	100	100	100
SPRAY VALVES, % Open							
SH Spray L	12	28	20	26	29	23	15
SH Spray R	26	34	29	34	36	26	12
RH Spray	11	13	30	32	31	15	15
MILL DATA							
Coal Flow 2-1 10E3 LB/HR	68	70	69	71	71	70	70
Coal Flow 2-2	69	70	70	71	72	71	70
Coal Flow 2-3	69	71	70	72	72	71	70
Coal Flow 2-4	69	66	65	67	67	66	66
Coal Flow 2-5	69	70	70	71	72	71	70
Coal Air Temp. 2-1, °F	163	162	163	163	162	162	162
Coal Air Temp. 2-2	163	163	163	164	163	163	163
Coal Air Temp. 2-3	164	163	164	163	163	164	164
Coal Air Temp. 2-4	164	165	165	165	165	165	164
Coal Air Temp. 2-5	163	164	164	164	164	164	164
Mill 2-1 Amps	73	73	72	73	74	73	73
Mill 2-2	70	71	71	71	72	70	71
Mill 2-3	71	73	72	73	72	72	72
Mill 2-4	84	78	74	79	78	75	75
Mill 2-5	75	74	75	75	75	74	75
Exh. Discharge "H_2O							
Mill 2-1	8.0	8.0	8.0	8.0	8.2	8.0	8.2
Mill 2-2	7.0	8.0	8.0	7.8	8.0	8.0	8.0
Mill 2-3	7.5	7.8	8.0	7.8	7.7	7.8	7.8
Mill 2-4	7.5	7.6	8.0	7.5	7.7	7.8	8.0
Mill 2-5	7.5	6.7	7.0	6.7	6.7	6.8	6.8
Diff. Press. 2-1 "H_2O	7.5	7.9	8.0	7.9	7.8	8.0	7.9
Diff. Press. 2-2	6.0	5.7	5.5	5.7	5.7	5.7	5.8
Diff. Press. 2-3	6.0	6.0	6.0	5.9	6.1	6.0	6.0
Diff. Press. 2-4	8.0	7.7	7.4	7.6	7.5	7.3	7.3
Diff. Press. 2-5	7.0	6.7	7.0	6.7	6.8	6.7	6.7
Mill 2-1 Suction	-1.3	-1.3	-1.0	-1.3	-1.3	-1.3	-1.3
Mill 2-2 Suction	-2.0	-2.1	-2.0	-2.1	-2.2	-2.2	-2.1
Mill 2-3 Suction	-2.0	-2.0	-2.0	-2.0	-2.0	-2.1	-2.0
Mill 2-4 Suction	-1.6	-1.7	-1.6	-1.7	-1.7	-1.8	-1.7
Mill 2-5 Suction	-1.6	-1.7	-1.5	-1.8	-1.7	-1.7	-1.7
Mill 2-1 Feeder Speed % Full	-	81	80	80	81	80	80
Mill 2-2 Feeder Speed	-	81	80	80	81	80	81
Mill 2-3 Feeder Speed	-	82	82	82	83	81	82
Mill 2-4 Feeder Speed	-	78	77	76	77	76	76
Mill 2-5 Feeder Speed	-	83	81	81	82	81	81

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	250	251	252	253	254	255	256	257
Date	*	*	*	*	3/29/82 **	*	3/30/82 **	3/30/82 **
FAN DAMPER, % Open								
FD Fan 2-1 Inlet							70	66
FD Fan 2-1 Outlet							100	100
FD Fan 2-2 Inlet							70	67
FD Fan 2-2 Outlet							100	100
FD Fan 2-1 Inlet							85	82
ID Fan 2-1 Outlet							100	100
ID Fan 2-2 Inlet							79	79
ID Fan 2-2 Outlet							100	100
SPRAY VALVES, % Open								
SH Spray L							0	18
SH Spray R							0	27
RH Spray							0	30
MILL DATA								
Coal Flow 2-1 10E3 LB/HR					68		70	69
Coal Flow 2-2					68		72	70
Coal Flow 2-3					68		70	69
Coal Flow 2-4					64		72	70
Coal Flow 2-5					68		70	69
Coal Air Temp. 2-1, °F					164		155	157
Coal Air Temp. 2-2					163		160	162
Coal Air Temp. 2-3					164		160	161
Coal Air Temp. 2-4					166		164	161
Coal Air Temp. 2-5					164		165	165
Mill 2-1 Amps					72		75	77
Mill 2-2					76		79	79
Mill 2-3					73		78	79
Mill 2-4					82		86	87
Mill 2-5					73		80	80
Exh. Discharge "H_2O								
Mill 2-1							8	8
Mill 2-2							7	7
Mill 2-3							8	7.5
Mill 2-4							7	7.5
Mill 2-5							7	7
Diff. Press. 2-1 "H_2O							8.5	7.9
Diff. Press. 2-2							6	6.9
Diff. Press. 2-3							6	6
Diff. Press. 2-4							9	7
Diff. Press. 2-5							6.5	6.5
Mill 2-1 Suction							-1	-1.3
Mill 2-2 Suction							-2	-2
Mill 2-3 Suction							-2	-2
Mill 2-4 Suction							-1.5	-1.5
Mill 2-5 Suction							-1.5	-1.7
Mill 2-1 Feeder Speed % Full							80	80
Mill 2-2 Feeder Speed							80	80
Mill 2-3 Feeder Speed							80	82
Mill 2-4 Feeder Speed							81	82
Mill 2-5 Feeder Speed							82	81

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** Only Board, Emissions and Limited Computer Data Available

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		258	259	260	261	262	263	264	265
Date		3/30/82 **	3/30/82 **	3/30/82 **	*	*	*	3/30/82 **	3/30/82 **
FAN DAMPER, % Open									
FD Fan 2-1 Inlet									
FD Fan 2-1 Outlet									
FD Fan 2-2 Inlet									
FD Fan 2-2 Outlet									
FD Fan 2-1 Inlet									
ID Fan 2-1 Outlet									
ID Fan 2-2 Inlet									
ID Fan 2-2 Outlet									
SPRAY VALVES, % Open									
SH Spray L									
SH Spray R									
RH Spray									
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		71	72	69				70	70
Coal Flow 2-2		72	73	70				70	71
Coal Flow 2-3		71	72	70				70	71
Coal Flow 2-4		72	73	70				71	71
Coal Flow 2-5		71	72	69				70	70
Coal Air Temp. 2-1, °F		157	157	162				164	164
Coal Air Temp. 2-2		161	160	160				163	163
Coal Air Temp. 2-3		161	161	160				164	164
Coal Air Temp. 2-4		164	163	163				166	167
Coal Air Temp. 2-5		164	165	165				164	163
Mill 2-1	Amps	77	76	77				72	72
Mill 2-2		78	80	79				76	73
Mill 2-3		80	79	78				73	71
Mill 2-4		84	88	87				82	84
Mill 2-5		80	80	80				73	73
Exh. Discharge	"H_2O								
Mill 2-1		8	8.5	8					
Mill 2-2		7.5	7	7.5					
Mill 2-3		8	7.5	7.5					
Mill 2-4		7.5	7.5	7.5					
Mill 2-5		7	7	7					
Diff. Press. 2-1	"H_2O	8	7.5	8.5					
Diff. Press. 2-2		6	6	7.5					
Diff. Press. 2-3		6	6	8					
Diff. Press. 2-4		8	8.5	9					
Diff. Press. 2-5		7	6.5	7					
Mill 2-1 Suction		-1.2	-1	-1					
Mill 2-2 Suction		02	-2	-2					
Mill 2-3 Suction		02	-2	-2					
Mill 2-4 Suction		-1.5	-1	-1.5					
Mill 2-5 Suction		-1.5	-1.6	-1.5					
Mill 2-1 Feeder Speed % Full		82	82	81					
Mill 2-2 Feeder Speed		82	82	82					
Mill 2-3 Feeder Speed		84	83	82					
Mill 2-4 Feeder Speed		83	83	82					
Mill 2-5 Feeder Speed		84	82	83					

* Only Board and Emissions Data Available

** Only Board, Emissions and Limited Computer Data Available

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		266	267	268	269
		*	*		
Date				3/31/82 **	3/31/82 **
FAN DAMPER, % Open					
FD Fan 2-1 Inlet					
FD Fan 2-1 Outlet					
FD Fan 2-2 Inlet					
FD Fan 2-2 Outlet					
FD Fan 2-1 Inlet					
ID Fan 2-1 Outlet					
ID Fan 2-2 Inlet					
ID Fan 2-2 Outlet					
SPRAY VALVES, % Open					
SH Spray L					
SH Spray R					
RH Spray					
MILL DATA					
Coal Flow 2-1 10E3 LB/HR				69	70
Coal Flow 2-2				70	70
Coal Flow 2-3				70	70
Coal Flow 2-4				70	70
Coal Flow 2-5				70	70
Coal Air Temp. 2-1, °F				164	164
Coal Air Temp. 2-2				163	163
Coal Air Temp. 2-3				164	163
Coal Air Temp. 2-4				165	166
Coal Air Temp. 2-5				164	163
Mill 2-1	Amps			71	74
Mill 2-2				70	71
Mill 2-3				72	72
Mill 2-4				83	83
Mill 2-5				74	74
Exh. Discharge	"H_2O				
Mill 2-1					
Mill 2-2					
Mill 2-3					
Mill 2-4					
Mill 2-5					
Diff. Press. 2-1	"H_2O				
Diff. Press. 2-2					
Diff. Press. 2-3					
Diff. Press. 2-4					
Diff. Press. 2-5					
Mill 2-1 Suction					
Mill 2-2 Suction					
Mill 2-3 Suction					
Mill 2-4 Suction					
Mill 2-5 Suction					
Mill 2-1 Feeder Speed % Full					
Mill 2-2 Feeder Speed					
Mill 2-3 Feeder Speed					
Mill 2-4 Feeder Speed					
Mill 2-5 Feeder Speed					

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APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	201	202	203	204	205	206
Test Date	3/16/82	3/16/82	3/16/82	3/16/82	3/16/82	3/16/82
TEMPERATURES						
Air & Gas, Degrees F						
Ambient Air	38	39	41	37	37	35
FD 2-1 Fan Outlet	54	56	58	55	55	50
FD 2-2 Fan Outlet	55	57	59	55	55	51
Stm. AH 2-1 Air Outlet	102	100	98	102	101	102
Stm. AH 2-2 Air Outlet	96	96	98	97	95	94
AH 2-1 Air Inlet	115	111	109	112	112	113
AH 2-2 Air Inlet	95	92	94	92	90	89
AH 2-1 Air Outlet	492	497	498	491	491	492
AH 2-2 Air Outlet	517	522	524	516	515	517
AH 2-1 Gas Inlet	623	639	640	622	620	625
AH 2-2 Gas Inlet	677	689	688	672	666	674
AH 2-1 Gas Outlet	258	259	261	256	256	257
AH 2-2 Gas Outlet	267	270	274	268	267	269
Steam & Water, Degrees F						
Feedwater to Economizer	476	479	479	477	476	477
Economizer Outlet	-	-	-	-	-	-
Boiler Downcomer	679	679	679	679	678	678
Desuperheater Inlet L	731	753	746	737	725	731
Desuperheater Inlet R	730	745	746	733	731	735
Desuperheater Outlet L	730	745	746	733	731	736
Desuperheater Outlet R	730	745	745	732	729	733
Throttle Steam	954	1012	1008	960	945	977
Reheat-Cold at Turbine	609	658	655	613	601	627
Reheat Atemp Inlet L	606	628	626	610	599	624
Reheat Atemp Inlet R	606	648	645	609	598	624
Reheat Boiler Outlet	952	1012	1012	958	941	969
HP EXTR Steam Inlet	608	656	655	611	600	626
HP FW Heater Inlet	412	414	413	412	411	412
HP FW Heater Drain	428	429	429	429	428	428
Auxiliary Steam	563	605	605	566	558	576
Miscellaneous						
Burner Tilt LR ± Deg	0	0	0	0	0	0
Burner Tilt LF ± Deg	0	0	0	0	0	0
Burner Tilt RF ± Deg	0	0	0	0	0	0
Burner Tilt RR ± Deg	0	0	0	0	0	0
Flue Gas Oxygen R	3.7	2.6	3.1	2.4	3.0	2.6
Flue Gas Oxygen L	3.0	4.4	4.9	4.0	4.3	4.6
Flue Gas Oxygen Avg.	3.4	3.5	4.0	3.3	3.4	3.6
Drum Level "H_2O	0.9	1.1	0.8	1.0	1.2	1.1
FD Fan 2-1 Amps	133	135	136	131	134	130
FD Fan 2-2 Amps	130	131	131	129	130	125
ID Fan 2-1 Amps	269	273	274	269	270	271
ID Fan 2-2 Amps	276	281	282	275	277	277

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	207	208	209	210	211	212
Test Date	3/16/82	3/16/82	3/17/82	3/17/82	3/17/82	3/17/82
TEMPERATURES						
Air & Gas, Degrees F						
Ambient Air	38	38	41	38	42	44
FD 2-1 Fan Outlet	53	53	52	53	53	54
FD 2-2 Fan Outlet	54	53	52	54	54	54
Stm. AH 2-1 Air Outlet	100	98	104	102	100	101
Stm. AH 2-2 Air Outlet	94	94	95	93	95	95
AH 2-1 Air Inlet	112	109	115	113	110	112
AH 2-2 Air Inlet	90	90	90	87	92	90
AH 2-1 Air Outlet	494	498	492	493	494	492
AH 2-2 Air Outlet	520	523	516	518	516	514
AH 2-1 Gas Inlet	632	632	629	629	625	622
AH 2-2 Gas Inlet	686	682	670	671	665	660
AH 2-1 Gas Outlet	260	261	257	257	260	258
AH 2-2 Gas Outlet	271	271	268	269	270	267
Steam & Water, Degrees F						
Feedwater to Economizer	478	478	479	478	478	476
Economizer Outlet	-	-	-	-	-	-
Boiler Downcomer	678	677	678	678	679	677
Desuperheater Inlet L	718	743	734	730	732	722
Desuperheater Inlet R	744	741	741	741	734	734
Desuperheater Outlet L	744	742	741	736	735	735
Desuperheater Outlet R	744	743	740	737	732	730
Throttle Steam	1006	997	1017	1004	976	964
Reheat-Cold at Turbine	648	645	660	651	628	616
Reheat Atemp Inlet L	644	642	654	647	627	614
Reheat Atemp Inlet R	643	642	655	647	627	614
Reheat Boiler Outlet	1005	1009	1022	1006	984	964
HP EXTR Steam Inlet	-	644	658	650	628	615
HP FW Heater Inlet	412	413	413	413	413	411
HP FW Heater Drain	428	429	428	428	429	428
Auxiliary Steam	589	597	607	601	585	571
Miscellaneous						
Burner Tilt LR ± Deg	0	0	0	0	0	0
Burner Tilt LF ± Deg	0	0	0	0	0	0
Burner Tilt RF ± Deg	0	0	0	0	0	0
Burner Tilt RR ± Deg	0	0	0	0	0	0
Flue Gas Oxygen R	2.7	3.3	2.4	2.9	2.9	2.6
Flue Gas Oxygen L	4.2	4.3	4.2	4.1	3.9	4.4
Flue Gas Oxygen Avg.	3.4	3.8	3.3	3.5	3.4	3.5
Drum Level "H_2O	1.1	0.8	1.1	0.7	1.0	1.2
FD Fan 2-1 Amps	133	133	131	132	131	131
FD Fan 2-2 Amps	129	130	128	129	128	127
ID Fan 2-1 Amps	271	272	268	267	268	267
ID Fan 2-2 Amps	280	281	272	274	274	276

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	213	214	215	216	217	218	219
Test Date	3/17/82	3/17/82	3/17/82	3/17/82	3/18/82	3/18/82	3/18/82
TEMPERATURES							
Air & Gas, Degrees F							
Ambient Air	45	44	42	42	44	45	46
FD 2-1 Fan Outlet	56	57	59	59	62	64	62
FD 2-2 Fan Outlet	57	56	59	59	62	64	62
Stm. AH 2-1 Air Outlet	100	100	99	100	101	101	101
Stm. AH 2-2 Air Outlet	94	95	99	97	99	101	100
AH 2-1 Air Inlet	101	110	110	111	112	112	111
AH 2-2 Air Inlet	89	91	96	92	95	98	95
AH 2-1 Air Outlet	497	494	497	496	496	498	496
AH 2-2 Air Outlet	521	517	519	518	516	519	518
AH 2-1 Gas Inlet	636	633	634	631	634	638	631
AH 2-2 Gas Inlet	682	677	672	672	664	668	670
AH 2-1 Gas Outlet	259	259	260	259	258	258	258
AH 2-2 Gas Outlet	269	267	271	269	270	272	273
Steam & Water, Degrees F							
Feedwater to Economizer	479	477	478	478	479	480	477
Economizer Outlet	-	-	-	-	-	-	-
Boiler Downcomer	678	677	677	678	680	678	678
Desuperheater Inlet L	739	747	736	737	731	739	735
Desuperheater Inlet R	748	747	745	743	744	750	742
Desuperheater Outlet L	748	739	746	743	738	726	741
Desuperheater Outlet R	742	739	738	737	738	728	739
Throttle Steam	1000	1011	1015	994	1013	1009	997
Reheat-Cold at Turbine	649	651	661	642	660	658	643
Reheat Atemp Inlet L	626	646	635	622	638	616	640
Reheat Atemp Inlet R	642	645	652	636	642	633	640
Reheat Boiler Outlet	1006	999	1018	997	1022	1009	1003
HP EXTR Steam Inlet	648	648	659	641	660	658	642
HP FW Heater Inlet	413	411	413	413	413	414	412
HP FW Heater Drain	429	427	428	428	429	429	428
Auxiliary Steam	600	587	598	585	604	595	590
Miscellaneous							
Burner Tilt LR ± Deg	-16	+9	0	-16	0	+10	-15
Burner Tilt LF ± Deg	-15	+9	0	-15	0	+10	-14
Burner Tilt RF ± Deg	-16	+8	0	-16	0	+10	-15
Burner Tilt RR ± Deg	-16	+9	0	-16	0	+11	-15
Flue Gas Oxygen R	2.5	2.3	2.0	2.1	1.8	2.3	2.6
Flue Gas Oxygen L	5.6	5.3	4.7	4.7	4.0	4.6	4.3
Flue Gas Oxygen Avg.	4.1	3.8	3.2	3.4	2.9	3.5	3.4
Drum Level "H_2O	1.0	1.3	1.0	1.0	0.9	1.6	0.8
FD Fan 2-1 Amps	136	134	131	130	131	130	130
FD Fan 2-2 Amps	133	132	128	127	128	129	127
ID Fan 2-1 Amps	276	275	266	266	265	264	264
ID Fan 2-2 Amps	286	280	274	273	272	272	270

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	220	221	222	223	224	225	226	227
Test Date	3/18/82	3/18/82	3/18/82	3/19/82	3/19/82	3/19/82	3/19/82	3/19/82
TEMPERATURES								
Air & Gas, Degrees F								
Ambient Air	41	35	33	35	34	34	32	36
FD 2-1 Fan Outlet	57	52	50	52	52	52	52	52
FD 2-2 Fan Outlet	78	52	51	53	53	52	51	53
Stm. AH 2-1 Air Outlet	102	101	101	104	101	102	102	103
Stm. AH 2-2 Air Outlet	97	92	91	94	94	92	92	92
AH 2-1 Air Inlet	112	111	112	115	112	114	114	114
AH 2-2 Air Inlet	94	88	86	89	88	88	89	90
AH 2-1 Air Outlet	494	496	499	494	495	489	488	484
AH 2-2 Air Outlet	519	521	523	517	518	525	524	521
AH 2-1 Gas Inlet	636	636	642	635	640	639	632	626
AH 2-2 Gas Inlet	676	682	681	679	682	694	684	686
AH 2-1 Gas Outlet	256	256	259	257	258	254	254	251
AH 2-2 Gas Outlet	270	270	271	270	269	281	279	276
Steam & Water, Degrees F								
Feedwater to Economizer	477	479	481	478	477	478	477	475
Economizer Outlet	-	-	-	-	-	-	-	-
Boiler Downcomer	678	677	674	674	675	676	676	676
Desuperheater Inlet L	735	730	750	738	713	744	739	736
Desuperheater Inlet R	734	743	749	747	749	743	737	731
Desuperheater Outlet L	735	733	718	746	744	730	727	730
Desuperheater Outlet R	736	735	719	740	740	732	730	737
Throttle Steam	969	1012	1005	1004	1001	1005	987	969
Reheat-Cold at Turbine	621	660	656	650	649	651	638	620
Reheat Atemp Inlet L	618	630	605	629	628	618	605	617
Reheat Atemp Inlet R	617	648	625	642	642	637	627	617
Reheat Boiler Outlet	970	1017	1016	1007	1003	1001	976	961
HP EXTR Steam Inlet	619	659	655	648	648	650	637	619
HP FW Heater Inlet	412	414	416	413	412	413	412	410
HP FW Heater Drain	428	429	430	429	428	429	428	427
Auxiliary Steam	566	600	575	597	599	583	582	572
Miscellaneous								
Burner Tilt LR ± Deg	-16	+10	+20	-16	-16	+9	+20	+9
Burner Tilt LF ± Deg	-15	+10	+20	-14	-14	+10	+20	+9
Burner Tilt RF ± Deg	-15	+9	+19	-15	-15	+9	+19	+9
Burner Tilt RR ± Deg	-16	+10	+21	-15	-15	+10	+21	+10
Flue Gas Oxygen R	4.5	5.1	4.1	2.1	2.7	5.8	5.6	5.9
Flue Gas Oxygen L	2.3	1.8	2.7	4.8	5.5	2.4	3.4	3.1
Flue Gas Oxygen Avg.	3.5	3.4	3.4	3.4	4.1	4.0	4.6	4.5
Drum Level "H_2O	1.0	1.3	1.5	1.0	1.2	1.2	0.8	1.0
FD Fan 2-1 Amps	131	133	133	133	137	136	138	137
FD Fan 2-2 Amps	127	129	129	129	132	132	133	134
ID Fan 2-1 Amps	267	267	270	268	275	272	275	275
ID Fan 2-2 Amps	275	277	278	278	285	289	295	293

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	228	229	230	231	232	233	234	235
Test Date	3/19/82	3/22/82	3/22/82	3/22/82	3/22/82	3/22/82	3/22/82	3/22/82
TEMPERATURES								
Air & Gas, Degrees F								
Ambient Air	36	40	43	42	44	44	42	41
FD 2-1 Fan Outlet	53	55	57	57	59	60	61	61
FD 2-2 Fan Outlet	53	54	56	58	58	58	59	59
Stm. AH 2-1 Air Outlet	105	96	95	95	95	93	94	91
Stm. AH 2-2 Air Outlet	92	100	99	99	100	100	99	100
AH 2-1 Air Inlet	117	106	105	105	105	103	104	101
AH 2-2 Air Inlet	90	96	94	94	95	95	94	96
AH 2-1 Air Outlet	483	496	499	496	498	503	504	504
AH 2-2 Air Outlet	520	521	516	511	513	517	519	517
AH 2-1 Gas Inlet	627	634	638	632	634	643	645	640
AH 2-2 Gas Inlet	685	680	684	670	675	682	687	677
AH 2-1 Gas Outlet	251	260	263	264	264	265	265	266
AH 2-2 Gas Outlet	276	262	263	264	263	263	263	262
Steam & Water, Degrees F								
Feedwater to Economizer	475	478	479	476	477	480	480	477
Economizer Outlet	-	-	-	-	-	-	-	-
Boiler Downcomer	677	675	676	676	676	676	676	678
Desuperheater Inlet L	727	738	747	733	743	747	752	738
Desuperheater Inlet R	728	741	743	739	744	753	754	745
Desuperheater Outlet L	727	734	726	739	744	726	720	745
Desuperheater Outlet R	731	736	729	735	742	728	722	739
Throttle Steam	-	1003	1023	993	1013	1010	1009	1006
Reheat-Cold at Turbine	595	652	666	639	658	658	658	650
Reheat Atemp Inlet L	594	621	634	636	640	617	617	646
Reheat Atemp Inlet R	594	635	652	636	649	635	636	646
Reheat Boiler Outlet	939	1009	1017	991	1020	1020	1026	1008
HP EXTR Steam Inlet	595	653	665	637	656	658	658	648
HP FW Heater Inlet	411	412	413	411	412	415	415	412
HP FW Heater Drain	428	427	429	427	428	430	430	428
Auxiliary Steam	553	604	599	590	604	587	587	581
Miscellaneous								
Burner Tilt LR ± Deg	-16	+18	+18	0	0	0	0	0
Burner Tilt LF ± Deg	-15	+18	+18	0	0	0	0	0
Burner Tilt RF ± Deg	-16	+17	+17	0	0	0	0	0
Burner Tilt RR ± Deg	-16	+19	+19	0	0	0	0	0
Flue Gas Oxygen R	5.6	4.6	5.0	2.6	2.7	2.9	3.2	2.5
Flue Gas Oxygen L	3.3	2.7	1.7	4.4	4.2	3.9	3.1	4.6
Flue Gas Oxygen Avg.	4.5	3.6	3.3	3.5	3.5	3.4	3.1	3.5
Drum Level "H_2O	0.9	1.3	1.2	0.8	0.9	1.4	1.5	0
FD Fan 2-1 Amps	136	133	132	133	132	131	130	128
FD Fan 2-2 Amps	132	130	129	129	128	128	127	125
ID Fan 2-1 Amps	273	277	276	276	277	274	272	274
ID Fan 2-2 Amps	291	271	268	272	271	268	267	268

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	236	237	238	239	240	241	242
Test Date	3/23/82	3/23/82	3/23/82	3/23/82	3/23/82	3/23/82	3/23/82
TEMPERATURES							
Air & Gas, Degrees F							
Ambient Air	44	43	50	55	49	49	51
FD 2-1 Fan Outlet	54	58	61	63	63	64	66
FD 2-2 Fan Outlet	53	57	60	61	62	63	63
Stm. AH 2-1 Air Outlet	94	92	92	93	93	93	93
Stm. AH 2-2 Air Outlet	99	99	99	99	100	100	101
AH 2-1 Air Inlet	104	102	100	100	101	101	101
AH 2-2 Air Inlet	95	96	95	95	97	97	99
AH 2-1 Air Outlet	502	502	502	501	500	503	505
AH 2-2 Air Outlet	516	516	517	515	514	518	520
AH 2-1 Gas Inlet	642	641	640	635	634	641	639
AH 2-2 Gas Inlet	677	678	673	665	664	673	674
AH 2-1 Gas Outlet	264	266	266	266	265	265	266
AH 2-2 Gas Outlet	263	264	263	263	262	261	266
Steam & Water, Degrees F							
Feedwater to Economizer	478	478	477	476	476	479	480
Economizer Outlet	-	-	-	-	-	-	-
Boiler Downcomer	675	676	675	676	676	675	674
Desuperheater Inlet L	743	737	734	732	729	735	752
Desuperheater Inlet R	750	745	747	739	735	747	748
Desuperheater Outlet L	731	738	747	739	735	736	730
Desuperheater Outlet R	733	739	741	733	730	739	732
Throttle Steam	1024	996	1003	973	965	1000	1006
Reheat-Cold at Turbine	666	644	-	624	618	647	656
Reheat Atemp Inlet L	622	627	646	621	615	644	605
Reheat Atemp Inlet R	639	637	645	621	615	643	625
Reheat Boiler Outlet	1017	997	1010	975	963	1015	1013
HP EXTR Steam Inlet	663	643	647	622	617	645	655
HP FW Heater Inlet	413	412	411	412	412	413	414
HP FW Heater Drain	428	428	427	428	428	429	430
Auxiliary Steam	599	589	598	577	571	585	592
Miscellaneous							
Burner Tilt LR ± Deg	0	0	0	0	0	0	0
Burner Tilt LF ± Deg	0	0	0	0	0	0	0
Burner Tilt RF ± Deg	0	0	0	0	0	0	0
Burner Tilt RR ± Deg	0	0	0	0	0	0	0
Flue Gas Oxygen R	3.0	2.9	2.7	2.7	3.2	2.7	3.1
Flue Gas Oxygen L	4.0	5.8	5.7	5.5	5.5	5.1	4.8
Flue Gas Oxygen Avg.	3.5	4.3	4.2	4.1	4.3	3.9	4.0
Drum Level "H_2O	1.4	1.1	0.8	0.7	0.9	1.3	1.0
FD Fan 2-1 Amps	129	134	133	131	130	131	132
FD Fan 2-2 Amps	126	130	130	128	127	129	128
ID Fan 2-1 Amps	270	277	278	275	273	277	273
ID Fan 2-2 Amps	265	275	274	270	268	269	272

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	243	244	245	246	247	248	249
Test Date	3/24/82	3/24/82	3/24/82	3/24/82	3/24/82	3/24/82	3/24/82
TEMPERATURES							
Air & Gas, Degrees F							
Ambient Air	48	49	49	49	49	48	48
FD 2-1 Fan Outlet	68	68	69	69	68	68	67
FD 2-2 Fan Outlet	67	68	68	67	67	66	66
Stm. AH 2-1 Air Outlet	94	94	94	95	93	94	94
Stm. AH 2-2 Air Outlet	105	106	105	105	104	103	105
AH 2-1 Air Inlet	103	102	103	104	101	103	103
AH 2-2 Air Inlet	103	104	102	102	100	100	103
AH 2-1 Air Outlet	500	501	502	501	502	501	501
AH 2-2 Air Outlet	512	510	513	513	514	512	511
AH 2-1 Gas Inlet	628	636	633	637	634	633	632
AH 2-2 Gas Inlet	656	656	658	654	652	649	647
AH 2-1 Gas Outlet	265	265	264	264	266	265	264
AH 2-2 Gas Outlet	263	265	265	263	267	267	264
Steam & Water, Degrees F							
Feedwater to Economizer	476	477	477	478	478	477	477
Economizer Outlet	-	-	-	-	-	-	-
Boiler Downcomer	676	677	677	676	676	677	677
Desuperheater Inlet L	743	739	739	741	741	737	735
Desuperheater Inlet R	742	747	744	748	750	749	745
Desuperheater Outlet L	730	716	725	717	717	723	728
Desuperheater Outlet R	732	718	728	719	718	725	731
Throttle Steam	1002	1009	990	1009	997	992	990
Reheat-Cold at Turbine	648	654	639	656	647	641	639
Reheat Atemp Inlet L	611	617	600	599	588	596	595
Reheat Atemp Inlet R	633	638	622	620	611	643	623
Reheat Boiler Outlet	1004	1012	996	1006	1003	1000	994
HP EXTR Steam Inlet	647	652	638	655	646	639	638
HP FW Heater Inlet	411	412	412	412	412	412	412
HP FW Heater Drain	427	427	427	427	427	427	427
Auxiliary Steam	595	582	567	585	572	571	576
Miscellaneous							
Burner Tilt LR ± Deg	0	0	0	0	0	0	0
Burner Tilt LF ± Deg	0	0	0	0	0	0	0
Burner Tilt RF ± Deg	0	0	0	0	0	0	0
Burner Tilt RR ± Deg	0	0	0	0	0	0	0
Flue Gas Oxygen R	3.2	2.5	2.4	2.5	1.8	1.7	1.6
Flue Gas Oxygen L	4.4	4.0	3.8	4.0	3.9	4.2	4.5
Flue Gas Oxygen Avg.	3.8	3.2	3.1	3.3	2.9	2.9	3.1
Drum Level "H_2O	1.0	1.1	0.8	1.3	1.0	0.8	0.8
FD Fan 2-1 Amps	131	126	128	128	128	128	127
FD Fan 2-2 Amps	127	123	124	124	124	124	125
ID Fan 2-1 Amps	269	266	265	267	266	267	266
ID Fan 2-2 Amps	266	263	262	263	262	261	261

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	250	251	252	253	254	255	256	257
Test Date	*	*	*	*	3/29/84 **	*	*	*
Air & Gas, Degrees F								
Ambient Air					30			
FD 2-1 Fan Outlet					50			
FD 2-2 Fan Outlet					48			
Stm. AH 2-1 Air Outlet					97			
Stm. AH 2-2 Air Outlet					99			
AH 2-1 Air Inlet								
AH 2-2 Air Inlet								
AH 2-1 Air Outlet								
AH 2-2 Air Outlet								
AH 2-1 Gas Inlet								
AH 2-2 Gas Inlet								
AH 2-1 Gas Outlet								
AH 2-2 Gas Outlet								
Steam & Water, Degrees F								
Feedwater to Economizer								
Economizer Outlet								
Boiler Downcomer								
Desuperheater Inlet L								
Desuperheater Inlet R								
Desuperheater Outlet L								
Desuperheater Outlet R								
Throttle Steam								
Reheat-Cold at Turbine								
Reheat Atemp Inlet L								
Reheat Atemp Inlet R								
Reheat Boiler Outlet								
HP EXTR Steam Inlet								
HP FW Heater Inlet								
HP FW Heater Drain								
Auxiliary Steam								
Miscellaneous								
Burner Tilt LR ± Deg					0			
Burner Tilt LF ± Deg					0			
Burner Tilt RF ± Deg					0			
Burner Tilt RR ± Deg					0			
Flue Gas Oxygen R								
Flue Gas Oxygen L								
Flue Gas Oxygen Avg.								
Drum Level "H_2O								
FD Fan 2-1 Amps								
FD Fan 2-2 Amps								
ID Fan 2-1 Amps								
ID Fan 2-2 Amps								

* Only Board and Emissions Data Available

** Only Board, Emissions and Limited Computer Data Available

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	258 *	259 *	260 *	261 *	262 *	263 *	264	265
Test Date							3/30/82 **	3/30/82 **
Air & Gas, Degrees F								
Ambient Air							36	37
FD 2-1 Fan Outlet							52	52
FD 2-2 Fan Outlet							53	53
Stm. AH 2-1 Air Outlet							92	93
Stm. AH 2-2 Air Outlet							98	97
AH 2-1 Air Inlet							102	103
AH 2-2 Air Inlet							93	91
AH 2-1 Air Outlet							508	507
AH 2-2 Air Outlet							523	524
AH 2-1 Gas Inlet							647	647
AH 2-2 Gas Inlet							688	686
AH 2-1 Gas Outlet							266	265
AH 2-2 Gas Outlet							263	264
Steam & Water, Degrees F								
Feedwater to Economizer							478	478
Economizer Outlet							-	0
Boiler Downcomer							-	0
Desuperheater Inlet L							759	753
Desuperheater Inlet R							764	759
Desuperheater Outlet L							724	729
Desuperheater Outlet R							726	731
Throttle Steam							1000	992
Reheat-Cold at Turbine							650	643
Reheat Atemp Inlet L							581	575
Reheat Atemp Inlet R							592	586
Reheat Boiler Outlet							1021	1013
HP EXTR Steam Inlet							647	641
HP FW Heater Inlet							414	414
HP FW Heater Drain							429	429
Auxiliary Steam							529	568
Miscellaneous								
Burner Tilt LR ± Deg							-16	-16
Burner Tilt LF ± Deg							-15	-15
Burner Tilt RF ± Deg							-16	-16
Burner Tilt RR ± Deg							-16	-16
Flue Gas Oxygen R							2.6	2.4
Flue Gas Oxygen L							4.4	4.5
Flue Gas Oxygen Avg.							3.5	3.4
Drum Level "H_2O							0.97	0.8
FD Fan 2-1 Amps							133	133
FD Fan 2-2 Amps							129	129
ID Fan 2-1 Amps							271	271
ID Fan 2-2 Amps							267	267

* Only Board and Emissions Data Available

** Only Board, Emissions and Limited Computer Data Available

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	266 *	267 *	268	269
Test Date			3/31/82	3/31/82
Air & Gas, Degrees F				
Ambient Air			52	51
FD 2-1 Fan Outlet			69	68
FD 2-2 Fan Outlet			70	68
Stm. AH 2-1 Air Outlet			92	93
Stm. AH 2-2 Air Outlet			101	101
AH 2-1 Air Inlet			100	101
AH 2-2 Air Inlet			96	96
AH 2-1 Air Outlet			506	506
AH 2-2 Air Outlet			517	518
AH 2-1 Gas Inlet			645	646
AH 2-2 Gas Inlet			679	679
AH 2-1 Gas Outlet			266	266
AH 2-2 Gas Outlet			263	262
Steam & Water, Degrees F				
Feedwater to Economizer			477	479
Economizer Outlet			-	-
Boiler Downcomer			677	676
Desuperheater Inlet L			743	743
Desuperheater Inlet R			754	755
Desuperheater Outlet L			729	729
Desuperheater Outlet R			731	731
Throttle Steam			998	998
Reheat-Cold at Turbine			649	-
Reheat Atemp Inlet L			585	583
Reheat Atemp Inlet R			598	592
Reheat Boiler Outlet			1001	1003
HP EXTR Steam Inlet			649	648
HP FW Heater Inlet			414	413
HP FW Heater Drain			429	429
Auxiliary Steam			580	582
Miscellaneous				
Burner Tilt LR ± Deg			-23	-24
Burner Tilt LF ± Deg			-22	-22
Burner Tilt RF ± Deg			-24	-24
Burner Tilt RR ± Deg			-24	-24
Flue Gas Oxygen R			2.9	2.9
Flue Gas Oxygen L			5.0	4.8
Flue Gas Oxygen Avg.			3.9	3.9
Drum Level "H_2O			1.0	-
FD Fan 2-1 Amps			132	132
FD Fan 2-2 Amps			128	127
ID Fan 2-1 Amps			275	275
ID Fan 2-2 Amps			270	270

* Only Board and Emissions Data Available

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		301*	302	303	304	305	306	307	308
Date	1982	9/20	9/20	9/20	9/20	9/20	9/20	9/20	9/20
FLOWS, 10E3 LB/HR									
Air Flow		2350	2300	2250	2250	2250	2400	NA	2300
Feedwater		2700	2600	2700	2700	2700	2700	NA	2700
Main Steam		2510	2500	2550	2550	2550	2550	NA	2550
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		-	-	-	-	-	-	-	-
Stm. AH Extr.		-	-	-	-	-	-	-	-
Stm. AH Aux.		-	-	-	-	-	-	-	-
Condensate Flow		-	-	-	-	-	-	-	-
Superheat Spray L		NA	10	0	0	5	12	35	50
Superheat Spray R		NA	10	5	10	15	15	20	40
Reheat Spray		-	-	-	-	-	-	-	-
PRESSURES Steam & Water, Psig									
Boiler Drum		2690	2680	2680	2680	2680	2680	2680	2680
Throttle Steam		2420	2420	2420	2420	2420	2420	2420	2420
Turbine 1st Stage		-	-	-	-	-	-	-	-
Turbine Cold Reheat		-	-	-	-	-	-	-	-
Reheat Inlet		-	-	-	-	-	-	-	-
Extr. Steam (HP-FW)		-	-	-	-	-	-	-	-
Main Steam		-	-	-	-	-	-	-	-
Aux. Steam		-	-	-	-	-	-	-	-
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		10	10	10	10	10	10.5	10.5	10.0
FD Fan 2-2 Discharge		10	11	10	10	10	11.0	11.0	10.5
AH 2-1 Air Diff.		-	-	-	-	-	-	-	-
AH 2-2 Air Diff.		-	-	-	-	-	-	-	-
Windbox Pressure L		5	5	5	5	5	5.0	5.0	5.0
Windbox Pressure R		5	5	5	5	5	5.0	5.0	5.0
WB/Furn. Diff. L		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
WB/Furn. Diff. R		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Furnace Draft		-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
SH Draft Diff.		-	-	-	-	-	-	-	-
Econ. Draft Diff.		-	-	-	-	-	-	-	-
AH 2-1 Gas Diff.		11.5	11	10.5	10.5	11	12.5	13	12.5
AH 2-2 Gas Diff.		11.5	11	11.0	11.0	11	12.5	13	12.5
ID Fan 2-1 Inlet		-14	-13	-13	-13	-13	-15	-15.5	-14
ID Fan 2-2 Inlet		-14	-13	-13	-13	-13	-15	-15.5	-14
Atm. Barometric "Hg		24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5

* Control room computer not working for tests 301-336
Only Board and Emissions Data Available

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		309	310	311	312	313	314	315	316
Date	1982	9/22	9/22	9/22	9/22	9/22	9/22	9/22	9/22
FLOWS, 10E3 LB/HR									
Air Flow		2220	2300	2350	2350	2300	2350	2320	2225
Feedwater		2900	2800	2800	2850	2800	2700	2900	2700
Main Steam		2510	2500	2550	2550	2550	2550	NA	2550
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		-	-	-	-	-	-	-	-
Stm. AH Extr.		-	-	-	-	-	-	-	-
Stm. AH Aux.		-	-	-	-	-	-	-	-
Condensate Flow		-	-	-	-	-	-	-	-
Superheat Spray L		5	15	10	10	0	60	23	27
Superheat Spray R		5	5	10	10	5	60	23	30
Reheat Spray		-	-	-	-	-	-	-	-
PRESSURES Steam & Water, Psig									
Boiler Drum		2720	2700	2700	2700	2700	2700	2700	2700
Throttle Steam		2420	2420	2420	2420	2420	2420	2420	2420
Turbine 1st Stage		-	-	-	-	-	-	-	-
Turbine Cold Reheat		-	-	-	-	-	-	-	-
Reheat Inlet		-	-	-	-	-	-	-	-
Extr. Steam (HP-FW)		-	-	-	-	-	-	-	-
Main Steam		-	-	-	-	-	-	-	-
Aux. Steam		-	-	-	-	-	-	-	-
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		11	10	10	10.5	10	10	10	10
FD Fan 2-2 Discharge		11	10	10	10.5	10	10	10.5	10
AH 2-1 Air Diff.		-	-	-	-	-	-	-	-
AH 2-2 Air Diff.		-	-	-	-	-	-	-	-
Windbox Pressure L		5.0	5.0	5	5	5	5	5	5
Windbox Pressure R		5.0	5.0	5	5	5	5	5	5
WB/Furn. Diff. L		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
WB/Furn. Diff. R		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Furnace Draft		-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
SH Draft Diff.		-	-	-	-	-	-	-	-
Econ. Draft Diff.		-	-	-	-	-	-	-	-
AH 2-1 Gas Diff.		12	11.5	12.5	12	11	12	11.5	11
AH 2-2 Gas Diff.		12	11.5	12.5	12	11	12	11.5	11
ID Fan 2-1 Inlet		-14.5	-13.5	-14.5	-14	-13	-14.5	-14	-12.5
ID Fan 2-2 Inlet		-14.5	-13.5	-14.5	-14	-13	-14.5	-14	-12.5
Atm. Barometric "Hg		24.6	24.6	24.6	24.6	24.6	24.5	24.5	24.5

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		317	318	319	320	321	322	323	324
Date	1982	9/23	9/23	9/23	9/24	9/24	9/24	9/24	9/24
FLOWS, 10E3 LB/HR									
Air Flow		2250	2250	2300	2250	2200	2200	2250	2200
Feedwater		2800	2800	2900	2500	2600	2650	2550	2350
Main Steam		2650	2650	2600	2350	2350	2450	2400	2350
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		-	-	-	-	-	-	-	-
Stm. AH Extr.		-	-	-	-	-	-	-	-
Stm. AH Aux.		-	-	-	-	-	-	-	-
Condensate Flow		-	-	-	-	-	-	-	-
Superheat Spray L		20	20	0	45	5	5	5	75
Superheat Spray R		30	30	5	30	10	10	10	70
Reheat Spray		-	-	-	-	-	-	-	-
PRESSURES Steam & Water, Psig									
Boiler Drum		2680	2680	2740	2650	2650	2660	2640	2600
Throttle Steam		2400	2400	2450	2420	2430	2420	2400	2330
Turbine 1st Stage		-	-	-	-	-	-	-	-
Turbine Cold Reheat		-	-	-	-	-	-	-	-
Reheat Inlet		-	-	-	-	-	-	-	-
Extr. Steam (HP-FW)		-	-	-	-	-	-	-	-
Main Steam		-	-	-	-	-	-	-	-
Aux. Steam		-	-	-	-	-	-	-	-
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		9.5	9.5	10	9.5	9.0	9.5	9.0	9.0
FD Fan 2-2 Discharge		9.5	9.5	10	9.5	9.5	10.0	9.0	9.0
AH 2-1 Air Diff.		-	-	-	-	-	-	-	-
AH 2-2 Air Diff.		-	-	-	-	-	-	-	-
Windbox Pressure L		5	5	5	5	5	5	5	5
Windbox Pressure R		5	5	5	5	5	5	5	5
WB/Furn. Diff. L		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
WB/Furn. Diff. R		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Furnace Draft		-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
SH Draft Diff.		-	-	-	-	-	-	-	-
Econ. Draft Diff.		-	-	-	-	-	-	-	-
AH 2-1 Gas Diff.		9	9	11	11	11	10.0	10.0	10.0
AH 2-2 Gas Diff.		12	12	11	10	10	9.5	9.5	9.5
ID Fan 2-1 Inlet		-11	-11	-12.5	-13	-13	-12.5	-12.5	-12.5
ID Fan 2-2 Inlet		-15	-15	-12.5	-11	-11	-10.5	-10.5	-10.5
Atm. Barometric "Hg		24.6	24.6	24.5	24.6	24.6	24.6	24.6	24.6

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		325	326	327	328	329	330	331	332
Date	1982	9/24	9/24	9/24	9/24	9/24	9/27	9/27	9/27
FLOWS, 10E3 LB/HR									
Air Flow		2200	2200	2150	2150	2300	2200	2300	2550
Feedwater		2500	2650	2600	2600	2600	2500	2900	2900
Main Steam		2300	2500	2300	2300	2450	2400	2600	2600
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		-	-	-	-	-	-	-	-
Stm. AH Extr.		-	-	-	-	-	-	-	-
Stm. AH Aux.		-	-	-	-	-	-	-	-
Condensate Flow		-	-	-	-	-	-	-	-
Superheat Spray L		35	0	10	0	0	0	15	10
Superheat Spray R		25	10	10	0	0	0	10	10
Reheat Spray		-	-	-	-	-	-	-	-
PRESSURES Steam & Water, Psig									
Boiler Drum		2600	2650	2640	2640	2640	2650	2720	2720
Throttle Steam		2380	2400	2400	2400	2400	2420	2440	2420
Turbine 1st Stage		-	-	-	-	-	-	-	-
Turbine Cold Reheat		-	-	-	-	-	-	-	-
Reheat Inlet		-	-	-	-	-	-	-	-
Extr. Steam (HP-FW)		-	-	-	-	-	-	-	-
Main Steam		-	-	-	-	-	-	-	-
Aux. Steam		-	-	-	-	-	-	-	-
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		9.0	9.0	8.5	6.5	10.0	9.0	11.0	13.0
FD Fan 2-2 Discharge		9.0	9.0	8.5	6.5	10.0	9.5	11.0	13.0
AH 2-1 Air Diff.		-	-	-	-	-	-	-	-
AH 2-2 Air Diff.		-	-	-	-	-	-	-	-
Windbox Pressure L		5	5	5	5	5	5	5	6
Windbox Pressure R		5	5	5	5	5	5	5	6
WB/Furn. Diff. L		5.5	5.5	5.5	5.5	5.5	5.5	5.5	6.5
WB/Furn. Diff. R		5.5	5.5	5.5	5.5	5.5	5.5	5.5	6.5
Furnace Draft		-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
SH Draft Diff.		-	-	-	-	-	-	-	-
Econ. Draft Diff.		-	-	-	-	-	-	-	-
AH 2-1 Gas Diff.		10.0	10.0	9.5	9.5	12.0	10.0	12.5	14.0
AH 2-2 Gas Diff.		10.0	9.5	9.5	9.5	10.0	10.0	12.5	14.0
ID Fan 2-1 Inlet		-12.5	-12.5	-11.0	-11.0	-15.0	-11.5	-15.0	-17.5
ID Fan 2-2 Inlet		-10.5	-10.5	-10.0	-10.0	-11.0	-12.0	-15.0	-17.0
Atm. Barometric "Hg		24.6	24.6	24.6	24.6	24.6	24.0	24.0	24.0

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		333	334	335	336	337	338*	339	340
Date	1982	9/27	9/27	9/27	9/27	9/28	9/28	9/28	9/28
FLOWS, 10E3 LB/HR									
Air Flow		2550	2450	2500	2400	3205	2450	3182	3087
Feedwater		3000	2900	2900	2900	2963	2800	2920	2859
Main Steam		2650	2700	2700	2700	2893	2650	2881	2879
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		-	-	-	-	31	-	31	30.7
Stm. AH Extr.		-	-	-	-	24	-	23	20.9
Stm. AH Aux.		-	-	-	-	0	-	0	0
Condensate Flow		-	-	-	-	2460	-	2424	2462
Superheat Spray L		10	15	15	30	31	10	26	44
Superheat Spray R		10	10	5	20	0	5	23	49
Reheat Spray		-	-	-	-	0	-	0	49
PRESSURES									
Steam & Water, Psig									
Boiler Drum		2700	2720	2720	2700	2660	2720	2700	2651
Throttle Steam		2420	2420	2420	2420	2399	2420	2420	2395
Turbine 1st Stage		-	-	-	-	1791	-	1798	1791
Turbine Cold Reheat		-	-	-	-	576	-	591	586
Reheat Inlet		-	-	-	-	532	-	528	543
Extr. Steam (HP-FW)		-	-	-	-	573	-	578	584
Main Steam		-	-	-	-	2423	-	2432	2421
Aux. Steam		-	-	-	-	347	-	350	352
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		15.5	12.0	11.0	11.0	11.0	11.0	11.0	10.5
FD Fan 2-2 Discharge		15.5	12.0	11.0	11.0	11.0	11.0	11.0	10.5
AH 2-1 Air Diff.		-	-	-	-	3.09	-	3.01	2.8
AH 2-2 Air Diff.		-	-	-	-	3.53	-	3.21	3.1
Windbox Pressure L		8.5	5.5	5.0	4.5	5.0	5.0	5.0	5.0
Windbox Pressure R		8.5	5.5	5.0	4.5	5.0	5.0	5.0	5.0
WB/Furn. Diff. L		9.0	6.0	5.5	5.5	5.5	5.5	5.5	5.6
WB/Furn. Diff. R		9.0	6.0	5.5	5.5	5.5	5.5	5.5	5.6
Furnace Draft		-0.5	-0.5	-0.5	-1.0	-0.5	-0.5	-0.5	-0.6
SH Draft Diff.		-	-	-	-	2.1	-	2.04	1.95
Econ. Draft Diff.		-	-	-	-	3.14	-	2.99	2.89
AH 2-1 Gas Diff.		14.5	13.5	13.0	13.0	13.0	13.0	12.5	12.0
AH 2-2 Gas Diff.		14.5	13.5	13.0	13.0	13.0	13.0	12.5	12.0
ID Fan 2-1 Inlet		-17.5	-16.0	-15.5	-16.0	-16.0	-15.5	-15.0	-14.6
ID Fan 2-2 Inlet		-17.5	-16.0	-15.5	-16.0	-16.0	-15.5	-15.0	-14.8
Atm. Barometric "Hg		24.0	24.0	24.0	24.0	24.4	24.4	24.2	24.4

* Board and Emissions Data Only

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		341	342	343	344	345	346	347	348
Date	1982	9/28	9/28	9/28	9/28	9/28	9/29	9/29	9/29
FLOWS, 10E3 LB/HR									
Air Flow		3010	2986	2974	2959	3119	3072	3145	3194
Feedwater		2799	2920	2944	2889	2796	2937	2892	2849
Main Steam		2867	2856	2911	2881	2877	2891	2868	2863
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		30.6	30	30	30	31	41	41	41
Stm. AH Extr.		20.3	21	17	20	21	35	30	29
Stm. AH Aux.		0	0	0	0	0	0	0	0
Condensate Flow		2469	2477	2457	2468	2496	2500	2476	2461
Superheat Spray L		68	41	0	26	81	21	45	54
Superheat Spray R		72	42	0	31	71	0	43	58
Reheat Spray		50	28	43	37	47	0	0	22
PRESSURES Steam & Water, Psig									
Boiler Drum		2633	2640	2683	2659	2637	2666	2664	2647
Throttle Steam		2380	2380	2419	2397	2382	2406	2410	2395
Turbine 1st Stage		1780	178	1807	1793	1782	1782	1783	1773
Turbine Cold Reheat		585	580	587	582	583	573	578	578
Reheat Inlet		543	536	543	539	541	530	535	536
Extr. Steam (HP-FW)		583	577	583	579	571	579	575	577
Main Steam		2404	2414	2440	2424	2407	2441	2431	2419
Aux. Steam		347	350	349	352	351	350	349	352
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		10	10	10	10.5	11	10.5	11	11
FD Fan 2-2 Discharge		10	10	10	10.5	11	10.5	11	11
AH 2-1 Air Diff.		2.7	2.68	2.7	2.8	3.02	2.8	2.9	3.0
AH 2-2 Air Diff.		3.05	2.90	2.9	2.9	3.10	3.1	3.2	3.4
Windbox Pressure L		5	5	5	5	5	5	5	5
Windbox Pressure R		5	5	5	5	5	5	5	5
WB/Furn. Diff. L		5.4	5.5	5.5	5.5	5.7	5.7	5.5	5.5
WB/Furn. Diff. R		5.4	5.5	5.5	5.5	5.7	5.7	5.5	5.5
Furnace Draft		-0.4	-0.5	-0.5	-0.5	-0.7	-0.7	-0.5	-0.5
SH Draft Diff.		1.96	1.9	1.85	1.9	2.1	1.9	2.1	2.2
Econ. Draft Diff.		2.8	2.8	2.7	2.6	3.0	2.8	2.9	3.1
AH 2-1 Gas Diff.		11.5	11.5	11.5	11.5	12.5	11.5	12.5	12.5
AH 2-2 Gas Diff.		11.5	11.5	11.5	11.5	12.5	12.0	12.5	12.5
ID Fan 2-1 Inlet		-14	-14	-13.9	-13.8	-14.8	-14	-15.1	-15
ID Fan 2-2 Inlet		-14	-14	-13.9	-13.9	-15.0	-14	-15.2	-16
Atm. Barometric "Hg		24.4	24.2	24.2	24.1	24.2	24.2	24.2	24.2

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		349	350	351*	352*	353*	354*	355*	356
Date	1982	9/29	9/29	9/30	9/30	9/30	9/30	9/30	9/30
FLOWS, 10E3 LB/HR									
Air Flow		3170	3072	2475	2400	2350	2200	2150	2528
Feedwater		2927	2902	2900	2900	2700	2600	2450	2428
Main Steam		2856	2868	2750	2750	2500	2450	2300	2450
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		41	40	-	-	-	-	-	38
Stm. AH Extr.		29	26	-	-	-	-	-	16
Stm. AH Aux.		0	0	-	-	-	-	-	0
Condensate Flow		2464	2510	-	-	-	-	-	2061
Superheat Spray L		32	41	30	20	10	20	20	39
Superheat Spray R		27	37	30	20	20	20	20	38
Reheat Spray		0	40	-	-	-	-	-	0
PRESSURES									
Steam & Water, Psig									
Boiler Drum		2651	2659	2750	2720	2680	2650	2640	2590
Throttle Steam		2395	2403	2420	2420	2420	2420	2420	2405
Turbine 1st Stage		1773	1780	-	-	-	-	-	1495
Turbine Cold Reheat		578	579	-	-	-	-	-	486
Reheat Inlet		535	536	-	-	-	-	-	450
Extr. Steam (HP-FW)		575	576	-	-	-	-	-	484
Main Steam		2419	2426	-	-	-	-	-	2422
Aux. Steam		348	349	-	-	-	-	-	349
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		11	10.5	11.5	11.0	10.5	9.5	9.0	8.0
FD Fan 2-2 Discharge		11	10.5	11.5	11.0	10.5	9.5	9.0	8.0
AH 2-1 Air Diff.		3.1	2.8	-	-	-	-	-	1.9
AH 2-2 Air Diff.		3.4	3.1	-	-	-	-	-	2.1
Windbox Pressure L		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Windbox Pressure R		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
WB/Furn. Diff. L		5.8	5.5	5.5	5.1	5.5	5.5	5.5	5.5
WB/Furn. Diff. R		5.8	5.5	5.5	5.1	5.5	5.5	5.5	5.5
Furnace Draft		-0.8	-0.5	-0.5	-0.6	-0.5	-0.5	-0.5	-0.5
SH Draft Diff.		2.1	1.8	-	-	-	-	-	1.4
Econ. Draft Diff.		3.0	2.8	-	-	-	-	-	2.1
AH 2-1 Gas Diff.		12.5	12.0	13.0	12.5	11.5	10.0	9.3	8.5
AH 2-2 Gas Diff.		12.5	12.0	13.5	12.5	12.0	10.5	9.8	8.5
ID Fan 2-1 Inlet		-15	-14.5	-15.5	-15	-14	-7.0	-11.0	-10.3
ID Fan 2-2 Inlet		-15	-14.5	-16.0	-15	-14.5	-7.5	-11.5	-11.1
Atm. Barometric "Hg		24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2

* Board and Emissions Data Only

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		357	358	359	360	361	362	363	364
Date	1982	9/30	9/30	9/30	9/30	9/30	9/30	9/30	9/30
FLOWS, 10E3 LB/HR									
Air Flow		2344	2290	2263	2804	2992	2346	2227	1715
Feedwater		2232	2073	1958	2532	2597	1900	1898	1354
Main Steam		2282	2161	2002	2538	2592	2017	2023	1410
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		39	38	39	39	39	39	39	39
Stm. AH Extr.		14	12	21	23	30	31	30	32
Stm. AH Aux.		0	0	0	0	0	0	0	0
Condensate Flow		1909	1877	1723	2203	2164	1750	1760	1193
Superheat Spray L		50	49	50	38	18	67	87	28
Superheat Spray R		44	50	43	43	0	79	88	26
Reheat Spray		0	0	0	0	0	0	0	0
PRESSURES Steam & Water, Psig									
Boiler Drum		2561	2520	2525	2599	2623	2532	2525	2454
Throttle Steam		2400	2378	2399	2395	2421	2408	2402	2392
Turbine 1st Stage		1387	1286	1209	1563	1546	1216	1214	820
Turbine Cold Reheat		452	421	393	505	497	395	396	265
Reheat Inlet		418	390	364	467	458	366	367	245
Extr. Steam (HP-FW)		450	420	392	503	495	395	396	266
Main Steam		2415	2390	2411	2414	2435	2417	2410	2394
Aux. Steam		349	346	346	347	346	349	347	347
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		7.5	6.5	6.0	9.5	10.0	6.5	6.0	3.0
FD Fan 2-2 Discharge		7.5	6.5	6.0	9.5	10.0	6.5	6.5	3.0
AH 2-1 Air Diff.		1.7	1.6	1.7	2.5	2.5	1.8	1.7	1.0
AH 2-2 Air Diff.		2.0	1.9	1.9	2.8	2.8	2.0	1.9	1.2
Windbox Pressure L		4.5	3.4	3.0	5.0	5.0	3.0	3.0	0.7
Windbox Pressure R		4.5	3.4	3.0	5.0	5.0	3.0	3.0	0.8
WB/Furn. Diff. L		5.0	4.0	3.5	5.6	5.2	3.3	3.7	1.1
WB/Furn. Diff. R		5.0	4.0	3.5	5.6	5.2	3.3	3.7	1.2
Furnace Draft		-0.5	-0.6	-0.5	-0.6	-.02	-0.3	-0.7	-0.4
SH Draft Diff.		1.1	1.1	1.0	1.6	1.7	1.1	0.9	0.54
Econ. Draft Diff.		1.9	1.8	1.7	2.5	2.5	1.8	1.6	1.05
AH 2-1 Gas Diff.		8.0	7.0	6.5	10.5	11.0	7.5	6.5	4.8
AH 2-2 Gas Diff.		8.5	8.0	7.5	11.0	11.5	8.0	7.5	5.5
ID Fan 2-1 Inlet		-9.1	-8.0	-8	-12.7	-12.0	-8.6	-8.2	-5.4
ID Fan 2-2 Inlet		-9.8	-9.0	-9	-13.1	-13.0	-9.3	-8.8	-6.1
Atm. Barometric "Hg		24.2	24.2	24.2	24.2	24.2	24.3	24.3	24.3

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		365	366*	388	389	390	391	392	393*
Date	1982	9/30	10/1	10/13	10/13	10/13	10/13	10/13	10/13
FLOWS, 10E3 LB/HR									
Air Flow		1596	1614	263	2671	2642	2639	2615	2637
Feedwater		1328	1295	1560	2545	2572	2578	2602	2619
Main Steam		1410	1401	2588	2586	2588	2592	2590	2593
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		44	45	30	30	29	29	29	28.9
Stm. AH Extr.		17	15	21	18	17	16	15	13
Stm. AH Aux.		13	14	0	0	0	0	0	0
Condensate Flow		1209	1224	2146	2165	2169	2163	2152	2206
Superheat Spray L		36	53	40	47	38	38	22	26
Superheat Spray R		33	50	29	38	31	27	0	15
Reheat Spray		0	0	0	0	0	0	0	0
PRESSURES									
Steam & Water, Psig									
Boiler Drum		2457	2462	2614	2613	2620	2619	2624	2621
Throttle Steam		2395	2402	2402	2400	2407	2406	2408	2406
Turbine 1st Stage		820	821	1589	1588	1591	1591	1592	1591
Turbine Cold Reheat		266	266	512	513	512	513	511	510
Reheat Inlet		246	247	473	474	473	473	472	471
Extr. Steam (HP-FW)		267	268	510	511	510	510	508	507
Main Steam		2397	2405	2421	2420	2427	2425	2427	2425
Aux. Steam		349	347	349	351	352	347	349	349
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		3.6	3.4	9.0	9.0	9.0	9.0	9.0	9.0
FD Fan 2-2 Discharge		3.6	3.4	9.5	9.5	9.5	9.5	9.5	9.5
AH 2-1 Air Diff.		1.0	0.9	2.1	2.2	2.1	2.2	2.2	2.2
AH 2-2 Air Diff.		1.0	1.0	2.5	2.5	2.5	2.4	2.5	2.5
Windbox Pressure L		1.4	1.4	5.0	5.0	5.0	5.0	5.0	4.8
Windbox Pressure R		1.6	1.6	5.0	5.0	5.0	5.0	5.0	4.8
WB/Furn. Diff. L		2.1	1.9	5.5	5.5	5.5	5.5	5.5	5.4
WB/Furn. Diff. R		2.3	2.1	5.7	5.5	5.7	5.7	5.7	5.6
Furnace Draft		-0.7	-0.5	-0.6	-0.5	-0.6	-0.6	-0.6	-0.6
SH Draft Diff.		0.4	0.45	1.4	1.5	1.5	1.5	1.5	1.5
Econ. Draft Diff.		0.9	0.87	2.2	2.3	2.3	2.3	2.3	2.3
AH 2-1 Gas Diff.		4.2	4.2	9.5	9.5	10.0	10.0	9.5	9.4
AH 2-2 Gas Diff.		4.9	4.9	10.0	10.0	10.5	10.5	10.0	10.1
ID Fan 2-1 Inlet		-5.0	-5.0	-11.3	-12.1	-11.5	-11.6	-11.3	-11.4
ID Fan 2-2 Inlet		-6.0	-5.0	-11.9	-12.9	-12.3	-12.2	-12.2	-12.0
Atm. Barometric "Hg		24.3	24.3	24.9	24.9	24.9	24.9	24.9	24.8

* Summary and Emissions data only for tests 367-387 and 394-401

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		402*	404*
Date	1982	10/15	10/15
FLOWS, 10E3 LB/HR			
Air Flow		2496	2508
Feedwater		2358	2351
Main Steam		2416	2414
Reheat Steam		NA	NA
Auxiliary Steam		45	45
Stm. AH Extr.		10	8
Stm. AH Aux.		0	0
Condensate Flow		2072	2053
Superheat Spray L		66	71
Superheat Spray R		61	71
Reheat Spray		0	0
PRESSURES Steam & Water, Psig			
Boiler Drum		2590	2586
Throttle Steam		2405	2401
Turbine 1st Stage		1471	1471
Turbine Cold Reheat		477	478
Reheat Inlet		441	442
Extr. Steam (HP-FW)		476	477
Main Steam		2420	2417
Aux. Steam		346	349
Air & Gas, "H_2O			
FD Fan 2-1 Discharge		7.7	7.6
FD Fan 2-2 Discharge		8.2	8.1
AH 2-1 Air Diff.		2.1	1.9
AH 2-2 Air Diff.		2.3	2.1
Windbox Pressure L		4.2	4.1
Windbox Pressure R		4.3	4.2
WB/Furn. Diff. L		4.7	4.5
WB/Furn. Diff. R		4.8	4.7
Furnace Draft		-0.5	-0.4
SH Draft Diff.		1.4	1.3
Econ. Draft Diff.		2.1	2.1
AH 2-1 Gas Diff.		8.5	8.6
AH 2-2 Gas Diff.		9.3	9.4
ID Fan 2-1 Inlet		-10.6	-10.7
ID Fan 2-2 Inlet		-11.5	-11.8
Atm. Barometric "Hg		24.9	24.9

* Summary and Emissions data only for tests 403 and 405

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		301*	302	303	304	305	306	307	308
Date	1982	9/20	9/20	9/20	9/20	9/20	9/20	9/20	9/20
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		65	65	65	64	64	68	68	66
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		68	68	68	66	68	70	72	70
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		80	78	82	79	78	85	80	82
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		73	72	75	72	72	76	74	74
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		16	8	0	0	4	10	20	28
SH Spray R		16	4	0	4	20	19	20	32
RH Spray		22	0	0	0	0	18	0	6
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		64	70	70	70	70	77	70	70
Coal Flow 2-2		78	70	70	75	70	77	70	75
Coal Flow 2-3		62	70	70	70	75	68	70	75
Coal Flow 2-4		62	70	70	75	75	70	70	75
Coal Flow 2-5		62	70	70	70	70	68	70	70
Coal Air Temp. 2-1, °F		160	160	160	160	160	160	160	160
Coal Air Temp. 2-2		165	155	155	155	155	155	155	155
Coal Air Temp. 2-3		165	165	165	165	165	165	165	165
Coal Air Temp. 2-4		160	160	160	160	160	160	160	160
Coal Air Temp. 2-5		160	160	165	160	160	160	160	160
Mill 2-1 Amps		74	76	76	76	76	75	76	76
Mill 2-2		80	76	76	76	76	76	76	76
Mill 2-3		76	78	78	78	78	78	78	78
Mill 2-4		74	76	76	76	76	76	76	76
Mill 2-5		74	74	74	74	74	74	74	74
Exh. Discharge "H_2O									
Mill 2-1		7.5	8.0	8.0	8.0	8.0	8.5	8.0	8.0
Mill 2-2		8.5	8.5	8.0	8.5	8.5	8.0	8.5	8.5
Mill 2-3		7.0	6.5	6.5	6.5	7.0	6.5	6.5	6.5
Mill 2-4		8.0	8.5	8.5	8.5	8.5	8.5	8.0	8.5
Mill 2-5		7.5	8.0	8.0	8.0	8.0	8.0	8.0	7.5
Diff. Press. 2-1 "H_2O		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Diff. Press. 2-2		6.0	5.5	5.5	5.5	5.5	5.5	6.0	5.5
Diff. Press. 2-3		7.0	7.0	7.0	7.0	7.0	7.5	7.0	7.0
Diff. Press. 2-4		6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Diff. Press. 2-5		7.0	7.0	7.0	6.5	6.5	6.5	7.0	6.5
Mill 2-1 Suction		-1.8	-1.8	-1.8	-1.7	-1.8	-1.8	-2.0	-2.0
Mill 2-2 Suction		-2.0	-2.5	-2.5	-2.6	-2.7	-2.6	-2.6	-2.7
Mill 2-3 Suction		-2.4	-2.0	-2.2	-2.3	-2.3	-2.3	-2.3	-2.4
Mill 2-4 Suction		-2.0	-2.0	-2.2	-2.3	-2.3	-2.2	-2.4	-2.3
Mill 2-5 Suction		-2.0	-2.0	-2.2	-2.3	-2.3	-2.2	-2.3	-2.3
Mill 2-1 Feeder Speed % Full		-	-	-	-	-	-	-	-
Mill 2-2 Feeder Speed		-	-	-	-	-	-	-	-
Mill 2-3 Feeder Speed		-	-	-	-	-	-	-	-
Mill 2-4 Feeder Speed		-	-	-	-	-	-	-	-
Mill 2-5 Feeder Speed		-	-	-	-	-	-	-	-

* Only Board and Emissions Data Available for Tests 301-336

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		309	310	311	312	313	314	315	316
Date	1982	9/22	9/22	9/22	9/22	9/22	9/22	9/22	9/22
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		66	67	68	66	64	68	68	64
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		70	68	71	70	69	70	70	68
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		82	82	84	82	80	82	84	80
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		74	75	86	75	74	76	78	74
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		2	6	8	6	2	30	15	18
SH Spray R		0	0	4	4	0	40	20	28
RH Spray		0	0	0	0	0	18	15	15
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		65	66	65	65	64	66	64	65
Coal Flow 2-2		80	82	82	80	80	82	80	80
Coal Flow 2-3		64	64	64	64	64	64	64	64
Coal Flow 2-4		65	66	64	64	64	66	64	64
Coal Flow 2-5		64	64	64	64	62	64	62	64
Coal Air Temp. 2-1, °F		160	160	160	160	160	160	160	160
Coal Air Temp. 2-2		155	155	155	155	155	155	155	155
Coal Air Temp. 2-3		165	165	165	165	165	165	165	165
Coal Air Temp. 2-4		160	160	160	160	160	160	160	160
Coal Air Temp. 2-5		155	155	155	155	155	160	155	160
Mill 2-1 Amps		76	76	76	76	76	75	76	76
Mill 2-2		80	82	82	82	80	82	82	82
Mill 2-3		78	78	78	76	78	76	78	80
Mill 2-4		74	76	74	74	76	74	75	76
Mill 2-5		74	74	74	74	74	74	74	74
Exh. Discharge "H_2O									
Mill 2-1		8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Mill 2-2		9.0	8.5	8.5	8.5	8.5	9.0	9.0	9.0
Mill 2-3		6.5	6.5	7.0	6.5	7.0	7.0	7.0	7.0
Mill 2-4		8.5	8.5	8.0	8.5	8.5	8.5	8.0	7.5
Mill 2-5		7.5	8.0	8.0	8.0	8.0	7.5	7.5	8.0
Diff. Press. 2-1 "H_2O		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Diff. Press. 2-2		6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0
Diff. Press. 2-3		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Diff. Press. 2-4		6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Diff. Press. 2-5		6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Mill 2-1 Suction		-1.8	-1.8	-1.8	-1.8	-1.9	-1.8	-2.0	-2.0
Mill 2-2 Suction		-2.2	-2.2	-2.1	-2.2	-2.2	-2.1	-2.0	-2.4
Mill 2-3 Suction		-2.3	-2.4	-2.3	-2.3	-2.4	-2.4	-2.4	-2.4
Mill 2-4 Suction		-2.3	-2.4	-2.3	-2.3	-2.3	-2.3	-2.0	-2.4
Mill 2-5 Suction		-2.3	-2.3	-2.3	-2.3	-2.3	-2.3	-2.4	-2.4
Mill 2-1 Feeder Speed % Full		-	-	-	-	-	-	-	-
Mill 2-2 Feeder Speed		-	-	-	-	-	-	-	-
Mill 2-3 Feeder Speed		-	-	-	-	-	-	-	-
Mill 2-4 Feeder Speed		-	-	-	-	-	-	-	-
Mill 2-5 Feeder Speed		-	-	-	-	-	-	-	-

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		317	318	319	320	321	322	323	324
Date	1982	9/23	9/23	9/23	9/24	9/24	9/24	9/24	9/24
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		66	66	68	65	60	60	63	63
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		64	64	65	69	68	68	62	62
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		76	76	81	82	80	82	80	80
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		80	80	75	90	88	90	89	88
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		10	10	0	25	5	6	0	32
SH Spray R		25	25	0	30	2	2	0	40
RH Spray		4	4	2	0	0	0	0	6
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		64	64	66	60	60	60	60	60
Coal Flow 2-2		80	80	82	75	75	74	74	74
Coal Flow 2-3		64	64	66	60	60	60	59	60
Coal Flow 2-4		64	64	66	60	60	60	59	60
Coal Flow 2-5		64	64	64	60	60	58	57	58
Coal Air Temp. 2-1, °F		160	160	160	160	160	160	160	160
Coal Air Temp. 2-2		155	155	155	155	155	155	155	155
Coal Air Temp. 2-3		165	165	165	165	165	165	165	165
Coal Air Temp. 2-4		160	160	160	160	160	160	160	160
Coal Air Temp. 2-5		155	155	160	155	155	155	155	155
Mill 2-1 Amps		76	76	76	75	75	74	74	74
Mill 2-2		82	82	82	80	80	80	80	80
Mill 2-3		78	78	78	76	78	76	76	76
Mill 2-4		76	76	76	74	74	74	74	74
Mill 2-5		74	74	74	74	74	74	74	74
Exh. Discharge "H_2O									
Mill 2-1		8.0	8.0	8.0	8.0	8.0	8.0	7.5	8.0
Mill 2-2		8.5	8.5	9.0	8.5	8.5	8.5	8.5	8.0
Mill 2-3		6.5	6.5	7.5	6.5	6.0	6.5	6.5	6.5
Mill 2-4		8.0	8.0	8.5	8.5	8.5	8.5	8.5	8.5
Mill 2-5		8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5
Diff. Press. 2-1 "H_2O		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Diff. Press. 2-2		6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0
Diff. Press. 2-3		7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5
Diff. Press. 2-4		6.0	6.0	6.5	6.5	6.5	6.5	6.5	6.0
Diff. Press. 2-5		6.5	6.5	7.5	6.5	6.5	6.5	6.5	6.5
Mill 2-1 Suction		-1.8	-1.8	-1.8	-2.0	-2.0	-2.0	-2.0	-2.0
Mill 2-2 Suction		-2.1	-2.1	-2.2	-2.4	-2.3	-2.4	-2.4	-2.4
Mill 2-3 Suction		-2.3	-2.3	-2.4	-2.4	-2.4	-2.5	-2.4	-2.4
Mill 2-4 Suction		-2.4	-2.4	-2.4	-2.4	-2.4	-2.5	-2.0	-2.5
Mill 2-5 Suction		-2.3	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3	-2.4
Mill 2-1 Feeder Speed % Full		-	-	-	-	-	-	-	-
Mill 2-2 Feeder Speed		-	-	-	-	-	-	-	-
Mill 2-3 Feeder Speed		-	-	-	-	-	-	-	-
Mill 2-4 Feeder Speed		-	-	-	-	-	-	-	-
Mill 2-5 Feeder Speed		-	-	-	-	-	-	-	-

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		325	326	327	328	329	330	331	332
Date	1982	9/24	9/24	9/24	9/24	9/24	9/27	9/27	9/27
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		63	63	62	62	65	60	68	73
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		62	62	60	60	65	62	70	74
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		81	79	78	78	83	87	84	88
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		89	87	86	86	86	70	76	80
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		22	0	6	0	8	0	8	8
SH Spray R		24	0	0	0	2	0	0	2
RH Spray		0	0	0	0	0	0	22	22
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		60	60	60	60	60	58	68	68
Coal Flow 2-2		74	74	74	74	75	72	86	84
Coal Flow 2-3		60	60	60	60	60	58	66	66
Coal Flow 2-4		60	60	60	60	60	58	68	68
Coal Flow 2-5		58	58	58	58	60	56	66	66
Coal Air Temp. 2-1, °F		160	160	160	160	160	160	160	160
Coal Air Temp. 2-2		155	155	155	155	155	160	160	160
Coal Air Temp. 2-3		165	165	165	165	165	165	165	165
Coal Air Temp. 2-4		160	160	155	155	160	160	160	160
Coal Air Temp. 2-5		155	155	155	155	155	155	155	160
Mill 2-1 Amps		74	74	74	74	74	74	72	78
Mill 2-2		80	80	80	80	80	80	82	82
Mill 2-3		76	76	76	78	78	76	78	78
Mill 2-4		74	74	74	74	74	72	76	76
Mill 2-5		74	74	74	74	74	73	74	74
Exh. Discharge "H_2O									
Mill 2-1		8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5
Mill 2-2		8.5	8.5	8.5	8.5	8.0	8.5	8.5	8.5
Mill 2-3		6.5	6.5	6.5	6.5	6.5	6.0	6.5	6.5
Mill 2-4		7.5	8.5	8.5	8.5	8.5	6.0	8.0	8.0
Mill 2-5		8.0	8.5	7.5	7.5	7.5	7.5	8.0	7.5
Diff. Press. 2-1 "H_2O		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Diff. Press. 2-2		6.0	6.0	6.0	6.0	6.0	6.0	6.5	6.5
Diff. Press. 2-3		7.0	7.0	7.0	6.5	7.0	6.5	7.0	7.0
Diff. Press. 2-4		6.5	6.5	6.5	6.5	6.5	6.0	6.5	6.5
Diff. Press. 2-5		6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Mill 2-1 Suction		-2.0	-2.0	-2.0	-2.0	-2.0	-1.9	-1.7	-1.6
Mill 2-2 Suction		-2.5	-2.5	-2.6	-2.5	-2.5	-2.2	-1.8	-1.7
Mill 2-3 Suction		-2.5	-2.4	-2.5	-2.5	-2.4	-2.4	-2.1	-2.0
Mill 2-4 Suction		-2.5	-2.5	-2.5	-2.5	-2.4	-2.4	-2.0	-2.0
Mill 2-5 Suction		-2.3	-2.3	-2.3	-2.4	-2.4	-2.4	-2.1	-2.0
Mill 2-1 Feeder Speed % Full		-	-	-	-	-	-	-	-
Mill 2-2 Feeder Speed		-	-	-	-	-	-	-	-
Mill 2-3 Feeder Speed		-	-	-	-	-	-	-	-
Mill 2-4 Feeder Speed		-	-	-	-	-	-	-	-
Mill 2-5 Feeder Speed		-	-	-	-	-	-	-	-

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		333*	334	335	336	337	338*	339	340	
Date	1982	9/27	9/27	9/27	9/27	9/28	9/28	9/28	9/28	
FAN DAMPER, % Open										
FD Fan 2-1 Inlet		77	71	68	68	68	68	67	68	
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100	
FD Fan 2-2 Inlet		78	72	70	70	70	70	69	68	
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100	
ID Fan 2-1 Inlet		89	86	84	82	86	82	83	82	
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100	
ID Fan 2-2 Inlet		81	79	76	76	78	74	76	76	
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100	
SPRAY VALVES, % Open										
SH Spray L		10	0	10	15	4	2	15	24	
SH Spray R		2	0	0	15	20	0	20	34	
RH Spray		0	6	2	10	0	0	5	54	
MILL DATA										
Coal Flow 2-1 10E3 LB/HR		64	66	66	64	65	66	66	66	
Coal Flow 2-2		84	84	84	84	81	82	82	82	
Coal Flow 2-3		66	66	66	66	66	64	66	66	
Coal Flow 2-4		66	66	66	66	66	64	66	66	
Coal Flow 2-5		65	66	66	66	65	64	65	66	
Coal Air Temp. 2-1, °F		160	160	160	160	163	160	160	163	
Coal Air Temp. 2-2		160	160	160	160	161	160	160	160	
Coal Air Temp. 2-3		165	165	165	165	160	165	165	160	
Coal Air Temp. 2-4		160	160	155	155	161	160	160	160	
Coal Air Temp. 2-5		155	160	155	160	162	155	160	162	
Mill 2-1 Amps		76	76	76	76	71	76	78	71	
Mill 2-2		82	82	82	82	74	82	82	75	
Mill 2-3		78	78	80	78	72	78	78	70	
Mill 2-4		74	76	78	76	71	76	76	71	
Mill 2-5		74	74	74	74	70	74	74	71	
Exh. Discharge "H_2O										
Mill 2-1		7.5	7.5	8.0	8.0	7.5	8.0	7.5	8.0	
Mill 2-2		8.5	8.5	7.5	8.5	8.0	8.5	8.5	8.0	
Mill 2-3		6.5	6.5	6.5	6.5	6.0	6.5	6.5	6.0	
Mill 2-4		8.5	8.0	8.5	8.0	8.0	8.0	8.0	8.0	
Mill 2-5		7.5	7.5	8.0	8.0	8.0	8.0	7.5	7.5	
Diff. Press. 2-1 "H_2O		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Diff. Press. 2-2		6.5	6.5	6.5	6.5	6.5	6.0	6.5	6.5	
Diff. Press. 2-3		7.5	7.0	7.0	7.5	7.0	7.0	7.0	7.0	
Diff. Press. 2-4		6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	
Diff. Press. 2-5		6.5	6.5	6.5	6.5	6.5	6.5	6.5	7.0	
Mill 2-1 Suction		-1.5	-1.5	-1.6	-1.7	-1.7	-1.7	-1.7	-1.7	
Mill 2-2 Suction		-1.5	-1.8	-1.8	-1.8	-2.0	-2.1	-2.0	-2.0	
Mill 2-3 Suction		-1.9	-2.1	-2.1	-2.1	-2.2	-2.3	-2.2	-2.2	
Mill 2-4 Suction		-2.0	-2.1	-2.0	-2.1	-2.2	-2.2	-2.0	-2.0	
Mill 2-5 Suction		-1.9	-2.1	-2.1	-2.2	-2.2	-2.2	-2.2	-2.2	-2.0
Mill 2-1 Feeder Speed % Full		-	-	-	-	66	-	66	66	
Mill 2-2 Feeder Speed		-	-	-	-	82	-	82	82	
Mill 2-3 Feeder Speed		-	-	-	-	64	-	64	66	
Mill 2-4 Feeder Speed		-	-	-	-	66	-	64	66	
Mill 2-5 Feeder Speed		-	-	-	-	64	-	63	64	

* Only Board and Emissions Data Available for Tests 301-336 and 338

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		341	342	343	344	345	346	347	348
Date	1982	9/28	9/28	9/28	9/28	9/28	9/29	9/29	9/29
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		65	64	64	64	67	65	68	66
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		68	66	66	66	69	66	68	68
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		82	82	82	80	84	80	82	84
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		74	76	75	73	78	74	74	76
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		30	20	0	10	30	10	22	26
SH Spray R		40	30	0	25	40	4	30	36
RH Spray		60	22	42	30	42	0	10	50
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		66	66	66	66	66	66	67	68
Coal Flow 2-2		82	82	82	82	82	83	84	85
Coal Flow 2-3		66	66	66	66	66	64	64	65
Coal Flow 2-4		66	66	66	66	66	67	67	69
Coal Flow 2-5		65	65	65	65	65	66	66	68
Coal Air Temp. 2-1, °F		164	162	163	163	163	163	163	163
Coal Air Temp. 2-2		160	160	160	160	161	161	160	159
Coal Air Temp. 2-3		161	160	161	160	160	161	160	159
Coal Air Temp. 2-4		161	160	162	160	161	161	161	160
Coal Air Temp. 2-5		162	162	162	160	162	162	162	161
Mill 2-1 Amps		71	70	71	71	70	71	76	71
Mill 2-2		75	74	74	75	74	74	82	76
Mill 2-3		72	70	72	71	71	70	78	70
Mill 2-4		70	70	71	71	72	72	78	73
Mill 2-5		70	70	70	70	71	70	74	70
Exh. Discharge "H_2O									
Mill 2-1		8.0	8.0	7.5	7.5	7.5	8.0	7.5	8.0
Mill 2-2		8.5	8.5	8.5	8.5	8.0	8.5	8.0	8.5
Mill 2-3		6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.5
Mill 2-4		8.0	8.5	8.0	8.0	8.5	8.0	8.0	8.0
Mill 2-5		8.5	8.0	7.5	7.5	7.5	8.0	8.0	7.5
Diff. Press. 2-1 "H_2O		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Diff. Press. 2-2		6.0	6.0	6.0	6.5	6.5	6.0	6.5	6.5
Diff. Press. 2-3		7.0	7.0	7.0	7.0	7.0	7.0	7.5	7.5
Diff. Press. 2-4		6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Diff. Press. 2-5		7.0	6.5	6.5	7.0	7.0	6.5	6.5	7.0
Mill 2-1 Suction		-1.8	-1.7	-1.8	-1.7	-1.6	-1.5	-1.6	-1.6
Mill 2-2 Suction		-2.0	-2.1	-2.1	-2.0	-2.0	-1.8	-1.8	-1.8
Mill 2-3 Suction		-2.2	-2.2	-2.3	-2.2	-2.1	-2.1	-2.1	-2.1
Mill 2-4 Suction		-2.0	-2.1	-2.0	-2.1	-2.0	-2.0	-2.1	-2.0
Mill 2-5 Suction		-2.2	-2.3	-2.2	-2.1	-2.1	-2.0	-2.1	-2.0
Mill 2-1 Feeder Speed % Full		66	66	64	66	66	66	68	68
Mill 2-2 Feeder Speed		82	82	82	82	84	84	84	86
Mill 2-3 Feeder Speed		66	66	65	66	66	64	64	66
Mill 2-4 Feeder Speed		66	66	66	66	66	66	68	68
Mill 2-5 Feeder Speed		64	64	64	64	64	66	66	66

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		349	350	351*	352*	353*	354*	355*	356
Date	1982	9/29	9/29	9/30	9/30	9/30	9/30	9/30	9/30
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		67	66	70	68	66	65	60	59
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		70	68	70	70	68	65	62	60
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		82	82	84	81	80	80	78	76
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		74	75	78	74	74	70	72	70
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		NA	20	15	8	0	10	14	30
SH Spray R		NA	30	20	18	18	20	22	38
RH Spray		NA	40	10	6	0	0	0	4
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		67	67	68	68	70	65	60	58
Coal Flow 2-2		84	84	86	86	85	80	74	72
Coal Flow 2-3		65	64	68	68	70	65	59	57
Coal Flow 2-4		68	67	68	68	70	65	59	58
Coal Flow 2-5		67	66	68	65	70	65	58	57
Coal Air Temp. 2-1, °F		163	163	160	160	160	160	160	163
Coal Air Temp. 2-2		159	159	160	160	160	160	155	156
Coal Air Temp. 2-3		159	160	165	165	165	165	165	161
Coal Air Temp. 2-4		160	160	160	165	160	160	160	161
Coal Air Temp. 2-5		161	161	155	160	155	160	155	162
Mill 2-1	Amps	71	71	76	76	75	75	75	70
Mill 2-2		75	76	84	82	85	80	80	72
Mill 2-3		69	73	80	80	80	75	78	69
Mill 2-4		72	72	76	76	70	75	74	68
Mill 2-5		70	69	74	74	75	75	75	68
Exh. Discharge	"H_2O								
Mill 2-1		8.0	8.0	8.0	8.0	8.5	8.0	7.5	7.5
Mill 2-2		8.5	8.5	8.5	8.5	8.0	8.5	8.5	8.0
Mill 2-3		6.5	7.0	6.5	6.5	6.5	6.5	6.0	6.0
Mill 2-4		8.5	8.0	8.0	8.0	8.0	8.0	8.4	8.5
Mill 2-5		8.0	7.5	7.5	8.0	7.5	7.5	7.0	7.0
Diff. Press. 2-1	"H_2O	7.0	7.0	7.0	7.0	6.5	7.5	7.0	7.0
Diff. Press. 2-2		6.5	6.5	6.5	7.0	6.5	6.5	6.5	6.0
Diff. Press. 2-3		7.5	7.5	7.5	7.0	7.0	7.0	7.0	6.5
Diff. Press. 2-4		7.0	7.0	6.5	7.0	6.5	6.5	6.5	6.5
Diff. Press. 2-5		6.5	6.5	7.0	7.0	7.0	7.0	6.8	6.5
Mill 2-1 Suction		-1.5	-1.6	-1.4	-1.5	-1.5	-1.5	-1.8	-1.8
Mill 2-2 Suction		-1.7	-1.7	-1.7	-1.5	-1.5	-2.0	-2.0	-2.2
Mill 2-3 Suction		-2.0	-2.1	-2.0	-2.0	-2.0	-2.0	-2.3	-2.4
Mill 2-4 Suction		-2.0	-2.0	-1.8	-2.0	-2.0	-2.0	-2.3	-2.5
Mill 2-5 Suction		-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.1	-2.2
Mill 2-1 Feeder Speed % Full		68	66	-	-	-	-	-	58
Mill 2-2 Feeder Speed		84	84	-	-	-	-	-	74
Mill 2-3 Feeder Speed		64	64	-	-	-	-	-	56
Mill 2-4 Feeder Speed		68	68	-	-	-	-	-	56
Mill 2-5 Feeder Speed		66	66	-	-	-	-	-	56

* Only Board and Emissions Data Available

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		357	358	359	360	361	362	363	364
Date	1982	9/30	9/30	9/30	9/30	9/30	9/30	9/30	9/30
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		57	55	55	63	65	55	55	45
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	92
FD Fan 2-2 Inlet		58	58	55	65	67	55	55	46
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	99
ID Fan 2-1 Inlet		76	71	70	80	78	75	70	60
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		70	65	65	72	72	70	65	55
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		28	32	30	20	0	40	50	30
SH Spray R		34	42	40	32	0	50	60	36
RH Spray		2	6	0	0	0	0	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		54	66	59	60	61	59	60	0
Coal Flow 2-2		68	82	74	74	76	74	74	67
Coal Flow 2-3		54	66	59	60	61	60	60	55
Coal Flow 2-4		54	66	59	60	61	60	60	54
Coal Flow 2-5		53	0	0	59	61	0	0	0
Coal Air Temp. 2-1, °F		162	163	162	163	163	163	163	138
Coal Air Temp. 2-2		154	154	155	156	156	156	155	153
Coal Air Temp. 2-3		160	160	160	160	161	160	160	158
Coal Air Temp. 2-4		160	160	160	160	162	161	160	160
Coal Air Temp. 2-5		162	102	107	162	163	117	117	113
Mill 2-1 Amps		68	70	69	69	69	69	70	0
Mill 2-2		72	74	73	73	73	72	73	72
Mill 2-3		68	69	70	69	68	70	69	67
Mill 2-4		67	70	70	69	68	69	69	67
Mill 2-5		67	52	0	68	68	0	0	0
Exh. Discharge "H_2O									
Mill 2-1		7.5	8.0	7.5	7.5	7.5	7.0	7.0	0
Mill 2-2		8.5	8.5	9.0	8.5	8.5	8.5	8.5	8.0
Mill 2-3		6.0	6.5	6.0	6.5	6.0	6.5	6.5	6.0
Mill 2-4		8.0	8.5	8.5	8.0	8.5	8.0	8.0	8.5
Mill 2-5		7.0	4	0	7.5	7.0	0	0	0
Diff. Press. 2-1 "H_2O		6.5	7.0	6.5	7.0	7.0	6.5	6.5	0
Diff. Press. 2-2		6.0	6.5	6.0	6.5	6.0	6.0	6.0	6.0
Diff. Press. 2-3		6.5	7.0	6.5	7.0	7.0	7.0	6.5	6.5
Diff. Press. 2-4		6.0	6.5	6.0	6.5	6.5	6.5	6.0	6.0
Diff. Press. 2-5		6.5	4.0	0	7.0	6.7	0	0	0
Mill 2-1 Suction		-1.9	-1.6	-2.0	-1.5	-1.5	-1.5	-2.0	-0.8
Mill 2-2 Suction		-2.3	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.6
Mill 2-3 Suction		-2.4	-2.2	-2.5	-2.0	-2.0	-2.0	-2.5	-2.6
Mill 2-4 Suction		-2.6	-2.1	-2.0	-2.0	-2.5	-2.0	-2.5	-2.8
Mill 2-5 Suction		-2.3	-3.5	-1.0	-2.0	-2.0	-1.0	-1.0	-1.0
Mill 2-1 Feeder Speed % Full		54	69	60	60	59	60	60	0
Mill 2-2 Feeder Speed		68	79	75	80	70	80	70	57
Mill 2-3 Feeder Speed		54	61	55	60	59	60	58	55
Mill 2-4 Feeder Speed		54	61	55	60	59	60	50	55
Mill 2-5 Feeder Speed		52	0	0	60	59	0	0	0

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		365	366*	388	389	390	391	392	393*
Date	1982	9/30	10/1	10/13	10/13	10/13	10/13	10/13	10/13
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		43	44	59	60	60	60	60	60
FD Fan 2-1 Outlet		87	86	100	100	100	100	100	100
FD Fan 2-2 Inlet		46	45	62	62	62	62	62	62
FD Fan 2-2 Outlet		91	91	100	100	100	100	100	100
ID Fan 2-1 Inlet		61	60	78	76	75	75	75	66
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		55	56	70	70	69	68	69	69
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		31	35	20	25	18	20	8	12
SH Spray R		39	34	25	30	21	25	0	12
RH Spray		0	0	0	0	0	0	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		0	0	58	72	57	56	55	55
Coal Flow 2-2		69	68	72	69	68	69	67	67
Coal Flow 2-3		55	55	58	56	55	56	54	54
Coal Flow 2-4		56	55	58	56	71	71	54	55
Coal Flow 2-5		0	0	57	56	54	55	71	71
Coal Air Temp. 2-1, °F		129	124	164	161	167	164	164	164
Coal Air Temp. 2-2		155	155	155	157	156	157	157	156
Coal Air Temp. 2-3		159	159	162	162	161	162	162	162
Coal Air Temp. 2-4		161	161	163	NA	157	162	163	162
Coal Air Temp. 2-5		111	109	162	162	161	162	161	161
Mill 2-1 Amps		0	0	69	73	69	69	69	69
Mill 2-2		72	72	72	71	72	71	70	71
Mill 2-3		70	67	69	71	68	68	68	67
Mill 2-4		70	67	67	67	72	72	67	72
Mill 2-5		0	0	69	69	69	68	72	62
Exh. Discharge "H_2O									
Mill 2-1		0	0	8.0	8.0	7.5	7.5	7.5	8.0
Mill 2-2		8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Mill 2-3		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.5
Mill 2-4		8.0	8.5	9.0	9.0	8.5	8.5	8.5	8.5
Mill 2-5		0	0	8.0	7.0	7.0	7.5	8.0	8.0
Diff. Press. 2-1 "H_2O		0	0	7.0	7.0	7.5	7.0	6.5	7.0
Diff. Press. 2-2		5.5	6.0	6.5	6.0	6.0	6.0	6.0	6.0
Diff. Press. 2-3		6.0	6.5	7.0	6.5	6.5	6.5	6.5	7.0
Diff. Press. 2-4		6.0	6.0	6.5	6.5	6.5	6.0	6.0	6.0
Diff. Press. 2-5		0	0	6.5	6.5	6.5	6.5	6.5	7.0
Mill 2-1 Suction		-1.0	-0.8	-1.8	-1.5	-2.0	-2.0	-2.0	-2.0
Mill 2-2 Suction		-2.5	-2.6	-2.5	-2.5	-2.6	-2.6	-2.6	-2.5
Mill 2-3 Suction		-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5
Mill 2-4 Suction		-2.6	-2.6	-2.5	-2.5	-2.0	-2.0	-2.5	-2.5
Mill 2-5 Suction		-1.0	-1.0	-2.5	-2.5	-2.5	-2.5	-2.0	-2.0
Mill 2-1 Feeder Speed % Full		0	0	60	80	55	55	55	55
Mill 2-2 Feeder Speed		68	69	75	70	70	70	70	69
Mill 2-3 Feeder Speed		56	55	60	58	55	55	55	55
Mill 2-4 Feeder Speed		56	55	60	55	75	75	55	55
Mill 2-5 Feeder Speed		0	0	55	55	55	55	75	70

* Summary and Emissions data only for tests 367-387 and 394-401

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		402*	404*
Date	1982	10/15	10/15
FAN DAMPER, % Open			
FD Fan 2-1 Inlet		58	58
FD Fan 2-1 Outlet		100	100
FD Fan 2-2 Inlet		60	60
FD Fan 2-2 Outlet		100	100
ID Fan 2-1 Inlet		77	76
ID Fan 2-1 Outlet		100	100
ID Fan 2-2 Inlet		69	69
ID Fan 2-2 Outlet		100	100
SPRAY VALVES, % Open			
SH Spray L		30	34
SH Spray R		40	40
RH Spray		0	0
MILL DATA			
Coal Flow 2-1 10E3 LB/HR		56	55
Coal Flow 2-2		60	69
Coal Flow 2-3		55	55
Coal Flow 2-4		56	55
Coal Flow 2-5		55	55
Coal Air Temp. 2-1, °F		164	164
Coal Air Temp. 2-2		155	155
Coal Air Temp. 2-3		161	162
Coal Air Temp. 2-4		162	162
Coal Air Temp. 2-5		162	NA
Mill 2-1	Amps	69	69
Mill 2-2		72	73
Mill 2-3		68	70
Mill 2-4		67	67
Mill 2-5		68	69
Exh. Discharge	"H_2O		
Mill 2-1		7.5	7.6
Mill 2-2		8.0	8.0
Mill 2-3		5.8	5.8
Mill 2-4		8.5	8.5
Mill 2-5		7.2	7.2
Diff. Press. 2-1	"H_2O	6.8	6.8
Diff. Press. 2-2		6.2	6.3
Diff. Press. 2-3		6.7	6.7
Diff. Press. 2-4		6.2	6.2
Diff. Press. 2-5		6.5	6.4
Mill 2-1 Suction		-2.0	-2.1
Mill 2-2 Suction		-2.5	-2.6
Mill 2-3 Suction		-2.5	-2.4
Mill 2-4 Suction		-2.7	-2.7
Mill 2-5 Suction		-2.5	-2.4
Mill 2-1 Feeder Speed % Full		61	62
Mill 2-2 Feeder Speed		61	62
Mill 2-3 Feeder Speed		61	62
Mill 2-4 Feeder Speed		61	62
Mill 2-5 Feeder Speed		61	62

* Summary and Emissions data only for tests 403 and 405

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		301*	302	303	304	305	306	307	308
Test Data	1982	9/20	9/20	9/20	9/20	9/20	9/20	9/20	9/20
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		72	72	69	69	69	71	71	72
FD 2-1 Fan Outlet		-	-	-	-	-	-	-	-
FD 2-2 Fan Outlet		-	-	-	-	-	-	-	-
Stm. AH 2-1 Air Outlet		-	-	-	-	-	-	-	-
Stm. AH 2-2 Air Outlet		-	-	-	-	-	-	-	-
AH 2-1 Air Inlet		-	-	-	-	-	-	-	-
AH 2-2 Air Inlet		-	-	-	-	-	-	-	-
AH 2-1 Air Outlet		-	-	-	-	-	-	-	-
AH 2-2 Air Outlet		-	-	-	-	-	-	-	-
AH 2-1 Gas Inlet		-	-	-	-	-	-	-	-
AH 2-2 Gas Inlet		-	-	-	-	-	-	-	-
AH 2-1 Gas Outlet		-	-	-	-	-	-	-	-
AH 2-2 Gas Outlet		-	-	-	-	-	-	-	-
Steam & Water, Degrees F									
Feedwater to Economizer		-	-	-	-	-	-	-	-
Economizer Outlet		-	-	-	-	-	-	-	-
Boiler Downcomer		-	-	-	-	-	-	-	-
Desuperheater Inlet L		-	-	-	-	-	-	-	-
Desuperheater Inlet R		-	-	-	-	-	-	-	-
Desuperheater Outlet L		-	-	-	-	-	-	-	-
Desuperheater Outlet R		-	-	-	-	-	-	-	-
Throttle Steam		1005	987	997	1002	1001	1005	1005	1000
Reheat-Cold at Turbine		-	-	-	-	-	-	-	-
Reheat Atemp Inlet L		-	-	-	-	-	-	-	-
Reheat Atemp Inlet R		-	-	-	-	-	-	-	-
Reheat Boiler Outlet		1000	995	1050	1000	1000	1000	1000	1013
HP EXTR Steam Inlet		-	-	-	-	-	-	-	-
HP FW Heater Inlet		-	-	-	-	-	-	-	-
HP FW Heater Drain		-	-	-	-	-	-	-	-
Auxiliary Steam		-	-	-	-	-	-	-	-
Miscellaneous									
Burner Tilt LR ± Deg		-4	-14	-14	-14	0	0	+15	+15
Burner Tilt LF ± Deg		-4	-14	-14	-14	0	0	+16	+16
Burner Tilt RF ± Deg		-4	-15	-15	-15	0	0	+15	+15
Burner Tilt RR ± Deg		-4	-15	-15	-15	0	0	+15	+15
Flue Gas Oxygen R		4.64	4.35	1.63	1.50	0.9	2.7	6.18	4.85
Flue Gas Oxygen L		2.36	2.85	4.60	4.80	5.4	6.3	3.35	2.26
Flue GAs Oxygen Avg.		3.50	3.60	3.12	3.2	3.2	4.5	4.77	3.56
Drum Level "H_2O		+1	+2	+2	+3	+2	-	-	-
FD Fan 2-1 Amps		-	-	-	-	-	-	-	-
FD Fan 2-2 Amps		-	-	-	-	-	-	-	-
ID Fan 2-1 Amps		-	-	-	-	-	-	-	-
ID Fan 2-2 Amps		-	-	-	-	-	-	-	-

* No Computer - Board and Emissions Only Tests 301-336

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		309	310	311	312	313	314	315	316
Test Data	1982	9/22	9/22	9/22	9/22	9/22	9/22	9/22	9/22
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		69	70	81	82	83	90	90	90
FD 2-1 Fan Outlet		-	-	-	-	-	-	-	-
FD 2-2 Fan Outlet		-	-	-	-	-	-	-	-
Stm. AH 2-1 Air Outlet		-	-	-	-	-	-	-	-
Stm. AH 2-2 Air Outlet		-	-	-	-	-	-	-	-
AH 2-1 Air Inlet		-	-	-	-	-	-	-	-
AH 2-2 Air Inlet		-	-	-	-	-	-	-	-
AH 2-1 Air Outlet		-	-	-	-	-	-	-	-
AH 2-2 Air Outlet		-	-	-	-	-	-	-	-
AH 2-1 Gas Inlet		-	-	-	-	-	-	-	-
AH 2-2 Gas Inlet		-	-	-	-	-	-	-	-
AH 2-1 Gas Outlet		-	-	-	-	-	-	-	-
AH 2-2 Gas Outlet		-	-	-	-	-	-	-	-
Steam & Water, Degrees F									
Feedwater to Economizer		-	-	-	-	-	-	-	-
Economizer Outlet		-	-	-	-	-	-	-	-
Boiler Downcomer		-	-	-	-	-	-	-	-
Desuperheater Inlet L		-	-	-	-	-	-	-	-
Desuperheater Inlet R		-	-	-	-	-	-	-	-
Desuperheater Outlet L		-	-	-	-	-	-	-	-
Desuperheater Outlet R		-	-	-	-	-	-	-	-
Throttle Steam		1005	1005	980	980	1000	1000	1000	1000
Reheat-Cold at Turbine		-	-	-	-	-	-	-	-
Reheat Atemp Inlet L		-	-	-	-	-	-	-	-
Reheat Atemp Inlet R		-	-	-	-	-	-	-	-
Reheat Boiler Outlet		1009	1008	987	980	998	1022	1016	1018
HP EXTR Steam Inlet		-	-	-	-	-	-	-	-
HP FW Heater Inlet		-	-	-	-	-	-	-	-
HP FW Heater Drain		-	-	-	-	-	-	-	-
Auxiliary Steam		-	-	-	-	-	-	-	-
Miscellaneous									
Burner Tilt LR ± Deg		+4	-5	-16	-16	-16	+16	0	0
Burner Tilt LF ± Deg		+4	-5	-16	-16	-16	+16	0	0
Burner Tilt RF ± Deg		+4	-5	-16	-16	-16	+16	0	0
Burner Tilt RR ± Deg		+3	-5	-16	-16	-16	+16	0	0
Flue Gas Oxygen R		3.02	4.53	2.82	2.37	1.94	3.95	3.41	2.43
Flue Gas Oxygen L		3.26	2.50	5.25	4.46	3.88	2.95	3.63	2.39
Flue GAs Oxygen Avg.		3.14	3.52	4.04	3.42	2.91	3.45	3.52	2.41
Drum Level "H_2O		-	-	-	-	-	-	-	-
FD Fan 2-1 Amps		-	-	-	-	-	-	-	-
FD Fan 2-2 Amps		-	-	-	-	-	-	-	-
ID Fan 2-1 Amps		-	-	-	-	-	-	-	-
ID Fan 2-2 Amps		-	-	-	-	-	-	-	-

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		317	318	319	320	321	322	323	324
Test Data	1982	9/23	9/23	9/23	9/24	9/24	9/24	9/24	9/24
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		79	79	86	77	78	79	79	82
FD 2-1 Fan Outlet		-	-	-	-	-	-	-	-
FD 2-2 Fan Outlet		-	-	-	-	-	-	-	-
Stm. AH 2-1 Air Outlet		-	-	-	-	-	-	-	-
Stm. AH 2-2 Air Outlet		-	-	-	-	-	-	-	-
AH 2-1 Air Inlet		-	-	-	-	-	-	-	-
AH 2-2 Air Inlet		-	-	-	-	-	-	-	-
AH 2-1 Air Outlet		-	-	-	-	-	-	-	-
AH 2-2 Air Outlet		-	-	-	-	-	-	-	-
AH 2-1 Gas Inlet		-	-	-	-	-	-	-	-
AH 2-2 Gas Inlet		-	-	-	-	-	-	-	-
AH 2-1 Gas Outlet		-	-	-	-	-	-	-	-
AH 2-2 Gas Outlet		-	-	-	-	-	-	-	-
Steam & Water, Degrees F									
Feedwater to Economizer		-	-	-	-	-	-	-	-
Economizer Outlet		-	-	-	-	-	-	-	-
Boiler Downcomer		-	-	-	-	-	-	-	-
Desuperheater Inlet L		-	-	-	-	-	-	-	-
Desuperheater Inlet R		-	-	-	-	-	-	-	-
Desuperheater Outlet L		-	-	-	-	-	-	-	-
Desuperheater Outlet R		-	-	-	-	-	-	-	-
Throttle Steam		1000	1000	1000	1005	1000	965	978	1000
Reheat-Cold at Turbine		-	-	-	-	-	-	-	-
Reheat Atemp Inlet L		-	-	-	-	-	-	-	-
Reheat Atemp Inlet R		-	-	-	-	-	-	-	-
Reheat Boiler Outlet		1008	1008	1008	1003	985	955	962	1001
HP EXTR Steam Inlet		-	-	-	-	-	-	-	-
HP FW Heater Inlet		-	-	-	-	-	-	-	-
HP FW Heater Drain		-	-	-	-	-	-	-	-
Auxiliary Steam		-	-	-	-	-	-	-	-
Miscellaneous									
Burner Tilt LR ± Deg		0	0	0	+20	0	-16	-16	+24
Burner Tilt LF ± Deg		0	0	0	+20	0	-16	-16	+24
Burner Tilt RF ± Deg		0	0	0	+20	0	-16	-16	+24
Burner Tilt RR ± Deg		0	0	0	+20	0	-16	-16	+24
Flue Gas Oxygen R		2.45	2.45	2.42	3.20	3.18	2.54	2.87	4.32
Flue Gas Oxygen L		2.26	2.26	2.15	4.60	4.28	4.65	3.93	2.55
Flue GAs Oxygen Avg.		2.36	2.36	2.29	3.90	5.18	3.60	3.40	3.44
Drum Level "H_2O		-	-	-	-	-	-	-	-
FD Fan 2-1 Amps		-	-	-	-	-	-	-	-
FD Fan 2-2 Amps		-	-	-	-	-	-	-	-
ID Fan 2-1 Amps		-	-	-	-	-	-	-	-
ID Fan 2-2 Amps		-	-	-	-	-	-	-	-

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		325	326	327	328	329	330	331	332
Test Data	1982	9/24	9/24	9/24	9/24	9/24	9/27	9/27	9/27
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		82	82	82	82	82	55	55	59
FD 2-1 Fan Outlet		-	-	-	-	-	-	-	-
FD 2-2 Fan Outlet		-	-	-	-	-	-	-	-
Stm. AH 2-1 Air Outlet		-	-	-	-	-	-	-	-
Stm. AH 2-2 Air Outlet		-	-	-	-	-	-	-	-
AH 2-1 Air Inlet		-	-	-	-	-	-	-	-
AH 2-2 Air Inlet		-	-	-	-	-	-	-	-
AH 2-1 Air Outlet		-	-	-	-	-	-	-	-
AH 2-2 Air Outlet		-	-	-	-	-	-	-	-
AH 2-1 Gas Inlet		-	-	-	-	-	-	-	-
AH 2-2 Gas Inlet		-	-	-	-	-	-	-	-
AH 2-1 Gas Outlet		-	-	-	-	-	-	-	-
AH 2-2 Gas Outlet		-	-	-	-	-	-	-	-
Steam & Water, Degrees F									
Feedwater to Economizer		-	-	-	-	-	-	-	-
Economizer Outlet		-	-	-	-	-	-	-	-
Boiler Downcomer		-	-	-	-	-	-	-	-
Desuperheater Inlet L		-	-	-	-	-	-	-	-
Desuperheater Inlet R		-	-	-	-	-	-	-	-
Desuperheater Outlet L		-	-	-	-	-	-	-	-
Desuperheater Outlet R		-	-	-	-	-	-	-	-
Throttle Steam		1000	980	1000	1000	985	985	1003	990
Reheat-Cold at Turbine		-	-	-	-	-	-	-	-
Reheat Atemp Inlet L		-	-	-	-	-	-	-	-
Reheat Atemp Inlet R		-	-	-	-	-	-	-	-
Reheat Boiler Outlet		993	956	979	981	976	984	1003	992
HP EXTR Steam Inlet		-	-	-	-	-	-	-	-
HP FW Heater Inlet		-	-	-	-	-	-	-	-
HP FW Heater Drain		-	-	-	-	-	-	-	-
Auxiliary Steam		-	-	-	-	-	-	-	-
Miscellaneous									
Burner Tilt LR ± Deg		0	-14	-14	-14	-14	-15	-15	-15
Burner Tilt LF ± Deg		0	-14	-14	-14	-14	-15	-15	-15
Burner Tilt RF ± Deg		0	-14	-14	-14	-14	-15	-15	-15
Burner Tilt RR ± Deg		0	-14	-14	-14	-14	-15	-15	-15
Flue Gas Oxygen R		2.63	3.00	3.97	2.26	5.47	2.72	2.33	3.42
Flue Gas Oxygen L		4.38	3.81	1.85	3.39	2.75	3.79	4.02	5.19
Flue GAs Oxygen Avg.		3.51	3.41	2.91	2.83	4.11	3.26	3.18	4.31
Drum Level "H_2O		-	-	-	-	-	-	-	-
FD Fan 2-1 Amps		-	-	-	-	-	-	-	-
FD Fan 2-2 Amps		-	-	-	-	-	-	-	-
ID Fan 2-1 Amps		-	-	-	-	-	-	-	-
ID Fan 2-2 Amps		-	-	-	-	-	-	-	-

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		333	334	335	336	337	338*	339	340
Test Data	1982	9/27	9/27	9/27	9/27	9/28	9/28	9/28	9/28
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		59	54	54	60	46	47	51	48
FD 2-1 Fan Outlet		-	-	-	-	62	-	60.8	64.5
FD 2-2 Fan Outlet		-	-	-	-	64	-	63	66.6
Stm. AH 2-1 Air Outlet		-	-	-	-	95	-	95	97
Stm. AH 2-2 Air Outlet		-	-	-	-	95	-	95.7	93
AH 2-1 Air Inlet		-	-	-	-	94	-	93	95
AH 2-2 Air Inlet		-	-	-	-	92	-	92	89
AH 2-1 Air Outlet		-	-	-	-	497	-	500	502
AH 2-2 Air Outlet		-	-	-	-	517	-	517	520
AH 2-1 Gas Inlet		-	-	-	-	618	-	624	625
AH 2-2 Gas Inlet		-	-	-	-	671	-	658	668
AH 2-1 Gas Outlet		-	-	-	-	263	-	265	263
AH 2-2 Gas Outlet		-	-	-	-	268	-	269	267
Steam & Water, Degrees F									
Feedwater to Economizer		-	-	-	-	476	-	477	479
Economizer Outlet		-	-	-	-	NA	-	NA	NA
Boiler Downcomer		-	-	-	-	676	-	677	676
Desuperheater Inlet L		-	-	-	-	642	-	741	746
Desuperheater Inlet R		-	-	-	-	735	-	741	743
Desuperheater Outlet L		-	-	-	-	729	-	725	718
Desuperheater Outlet R		-	-	-	-	732	-	726	720
Throttle Steam		970	1000	1000	1005	1000	1000	999	1002
Reheat-Cold at Turbine		-	-	-	-	653	-	653	658
Reheat Atemp Inlet L		-	-	-	-	649	-	642	597
Reheat Atemp Inlet R		-	-	-	-	648	-	642	607
Reheat Boiler Outlet		978	1012	1010	1013	1013	1008	1017	1023
HP EXTR Steam Inlet		-	-	-	-	651	-	652	657
HP FW Heater Inlet		-	-	-	-	422	-	424	425
HP FW Heater Drain		-	-	-	-	430	-	432	432
Auxiliary Steam		-	-	-	-	567	-	565	557
Miscellaneous									
Burner Tilt LR ± Deg		-15	-15	-15	-15	0	0	0	+15
Burner Tilt LF ± Deg		-15	-15	-15	-15	0	0	0	+15
Burner Tilt RF ± Deg		-15	-15	-15	-15	0	0	0	+15
Burner Tilt RR ± Deg		-15	-15	-15	-15	0	0	0	+15
Flue Gas Oxygen R		3.67	2.95	1.86	2.52	5.6	3.10	3.4	2.9
Flue Gas Oxygen L		5.27	4.72	3.95	3.78	2.5	3.66	3.6	2.7
Flue GAs Oxygen Avg.		4.47	3.84	2.91	3.15	4.1	3.38	3.5	2.8
Drum Level "H_2O		-	-	-	-	2.23	-	1.96	2.14
FD Fan 2-1 Amps		-	-	-	-	130	-	128	125
FD Fan 2-2 Amps		-	-	-	-	129	-	128	124
ID Fan 2-1 Amps		-	-	-	-	271	-	268	262
ID Fan 2-2 Amps		-	-	-	-	277	-	272	267

* Only Board and Emissions Data Available

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		341	342	343	344	345	346	347	348
Test Data	1982	9/28	9/28	9/28	9/28	9/28	9/29	9/29	9/29
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		47	46	47	47	49	36	43	43
FD 2-1 Fan Outlet		64	64	65	65	66	54	58	59
FD 2-2 Fan Outlet		65	64	66	65	69	54	57	58
Stm. AH 2-1 Air Outlet		96	95	95	97	97	100	99	98
Stm. AH 2-2 Air Outlet		94	95	94	95	93	98	94	93
AH 2-1 Air Inlet		94	95	93	95	97	95	95	94
AH 2-2 Air Inlet		89	91	89	90	88	93	90	90
AH 2-1 Air Outlet		503	503	502	502	504	495	501	502
AH 2-2 Air Outlet		520	520	517	518	523	511	522	524
AH 2-1 Gas Inlet		623	624	619	622	633	614	629	631
AH 2-2 Gas Inlet		666	664	656	659	673	652	672	677
AH 2-1 Gas Outlet		263	264	263	264	264	260	261	262
AH 2-2 Gas Outlet		268	267	268	266	271	262	266	267
Steam & Water, Degrees F									
Feedwater to Economizer		479	479	478	478	479	475	477	478
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		676	677	678	677	676	676	677	676
Desuperheater Inlet L		745	742	734	739	749	725	746	752
Desuperheater Inlet R		743	714	726	737	752	733	744	747
Desuperheater Outlet L		712	721	726	722	711	721	723	716
Desuperheater Outlet R		714	723	728	724	713	719	725	718
Throttle Steam		992	1004	1001	998	995	982	999	999
Reheat-Cold at Turbine		652	659	655	653	652	636	653	654
Reheat Atemp Inlet L		590	620	608	616	604	632	638	631
Reheat Atemp Inlet R		600	623	612	619	608	631	638	632
Reheat Boiler Outlet		1022	1030	1001	1010	1016	990	1028	1035
HP EXTR Steam Inlet		652	658	654	653	652	635	652	652
HP FW Heater Inlet		425	425	424	424	424	421	423	424
HP FW Heater Drain		432	432	431	431	431	429	431	431
Auxiliary Steam		549	546	556	551	539	576	576	570
Miscellaneous									
Burner Tilt LR ± Deg		15	0	0	0	0	-17	0	10
Burner Tilt LF ± Deg		15	0	0	0	0	-17	0	10
Burner Tilt RF ± Deg		15	0	0	0	0	-16	0	9
Burner Tilt RR ± Deg		15	0	0	0	0	-16	0	10
Flue Gas Oxygen R		2.7	2.0	2.3	2.6	3.0	2.2	3.4	3.8
Flue Gas Oxygen L		2.0	3.2	2.7	2.3	3.8	4.0	3.5	3.1
Flue Gas Oxygen Avg.		2.4	2.6	2.5	2.5	3.4	3.1	3.5	3.4
Drum Level "H_2O		2.3	1.9	2.1	2.3	2.0	1.9	1.5	2.0
FD Fan 2-1 Amps		122	122	122	122	126	128	128	128
FD Fan 2-2 Amps		122	122	122	123	127	129	128	128
ID Fan 2-1 Amps		261	260	260	260	266	263	270	266
ID Fan 2-2 Amps		264	264	264	263	271	266	274	272

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		349	350	351*	352*	353*	354*	355*	356
Test Data	1982	9/29	9/29	9/30	9/30	9/30	9/30	9/30	9/30
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		43	43	61	61	61	61	58	52
FD 2-1 Fan Outlet		61	61	-	-	-	-	-	71
FD 2-2 Fan Outlet		60	60	-	-	-	-	-	71
Stm. AH 2-1 Air Outlet		99	98	-	-	-	-	-	105
Stm. AH 2-2 Air Outlet		95	96	-	-	-	-	-	96
AH 2-1 Air Inlet		95	94	-	-	-	-	-	102
AH 2-2 Air Inlet		90	92	-	-	-	-	-	92
AH 2-1 Air Outlet		500	502	-	-	-	-	-	488
AH 2-2 Air Outlet		521	519	-	-	-	-	-	501
AH 2-1 Gas Inlet		632	628	-	-	-	-	-	585
AH 2-2 Gas Inlet		672	664	-	-	-	-	-	625
AH 2-1 Gas Outlet		261	262	-	-	-	-	-	254
AH 2-2 Gas Outlet		265	264	-	-	-	-	-	262
Steam & Water, Degrees F									
Feedwater to Economizer		477	477	-	-	-	-	-	461
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		676	677	-	-	-	-	-	674
Desuperheater Inlet L		745	742	-	-	-	-	-	737
Desuperheater Inlet R		745	741	-	-	-	-	-	736
Desuperheater Outlet L		727	721	-	-	-	-	-	719
Desuperheater Outlet R		729	723	-	-	-	-	-	721
Throttle Steam		1003	998	1010	1000	1000	1000	1000	998
Reheat-Cold at Turbine		657	653	-	-	-	-	-	623
Reheat Atemp Inlet L		610	607	-	-	-	-	-	611
Reheat Atemp Inlet R		613	610	-	-	-	-	-	613
Reheat Boiler Outlet		1019	1012	1020	1014	1003	1005	1003	1007
HP EXTR Steam Inlet		565	652	-	-	-	-	-	622
HP FW Heater Inlet		424	423	-	-	-	-	-	410
HP FW Heater Drain		431	431	-	-	-	-	-	412
Auxiliary Steam		581	576	-	-	-	-	-	585
Miscellaneous									
Burner Tilt LR ± Deg		-10	-10	+17	-5	-3	+23	+20	+17
Burner Tilt LF ± Deg		-10	-10	+17	-5	+23	+23	+20	+17
Burner Tilt RF ± Deg		-10	-10	+17	-5	-3	+23	+20	+17
Burner Tilt RR ± Deg		-10	-10	+17	-5	-3	+23	+20	+17
Flue Gas Oxygen R		3.6	3.1	2.8	2.75	4.8	2.95	2.95	1.83
Flue Gas Oxygen L		3.2	2.7	2.2	2.75	0.8	1.45	2.35	3.49
Flue GAs Oxygen Avg.		3.4	2.9	2.5	2.75	2.8	2.20	2.65	2.66
Drum Level "H_2O		1.9	2.0	-	-	-	-	-	2.4
FD Fan 2-1 Amps		127	125	-	-	-	-	-	114
FD Fan 2-2 Amps		127	125	-	-	-	-	-	113
ID Fan 2-1 Amps		266	260	-	-	-	-	-	247
ID Fan 2-2 Amps		270	265	-	-	-	-	-	248

* Only Board and Emissions Data Available

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		357	358	359	360	361	362	363	364
Test Data	1982	9/30	9/30	9/30	9/30	9/30	9/30	9/30	9/30
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		52	52	53	49	48	45	45	44
FD 2-1 Fan Outlet		71	71	72	64	63	63	62	65
FD 2-2 Fan Outlet		71	71	71	65	64	63	62	64
Stm. AH 2-1 Air Outlet		106	107	111	102	106	113	114	125
Stm. AH 2-2 Air Outlet		96	94	102	97	96	102	103	111
AH 2-1 Air Inlet		103	103	108	98	104	109	108	120
AH 2-2 Air Inlet		93	93	99	92	91	98	99	107
AH 2-1 Air Outlet		485	481	474	492	487	470	468	437
AH 2-2 Air Outlet		496	494	484	508	508	484	482	447
AH 2-1 Gas Inlet		573	571	559	602	603	557	552	505
AH 2-2 Gas Inlet		612	612	597	646	647	599	589	536
AH 2-1 Gas Outlet		253	252	246	258	256	247	245	229
AH 2-2 Gas Outlet		260	262	255	266	263	258	256	243
Steam & Water, Degrees F									
Feedwater to Economizer		454	449	449	464	461	444	444	409
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		672	671	670	673	674	668	668	663
Desuperheater Inlet L		739	646	747	746	789	747	743	734
Desuperheater Inlet R		740	641	748	742	740	739	740	738
Desuperheater Outlet L		713	700	716	726	737	699	692	711
Desuperheater Outlet R		715	700	717	727	741	701	694	712
Throttle Steam		1002	1003	1018	999	1003	1005	1001	1001
Reheat-Cold at Turbine		617	626	614	633	628	604	601	563
Reheat Atemp Inlet L		603	604	598	620	625	599	596	550
Reheat Atemp Inlet R		605	606	601	626	626	600	597	554
Reheat Boiler Outlet		1009	1014	1008	1004	992	992	1003	961
HP EXTR Steam Inlet		616	622	613	632	628	603	600	562
HP FW Heater Inlet		404	399	393	412	409	394	394	362
HP FW Heater Drain		406	399	393	416	413	394	394	359
Auxiliary Steam		592	581	606	595	603	583	570	603
Miscellaneous									
Burner Tilt LR ± Deg		+11	-6	-7	-10	+20	+24	+24	27
Burner Tilt LF ± Deg		+11	-6	-7	-10	+20	+24	+24	27
Burner Tilt RF ± Deg		+10	-5	-6	-9	+20	+24	+24	26
Burner Tilt RR ± Deg		+11	-5	-6	-9	+20	+24	+24	28
Flue Gas Oxygen R		0.80	4.7	3.8	3.6	5.5	5.6	4.2	4.7
Flue Gas Oxygen L		3.38	0.7	3.8	3.8	3.1	3.6	2.8	5.2
Flue GAs Oxygen Avg.		2.08	2.74	3.8	3.7	4.3	4.6	3.5	5.0
Drum Level "H_2O		2.3	2.1	1.8	2.1	1.8	2.0	2.2	1.9
FD Fan 2-1 Amps		110	108	109	122	121	112	110	98
FD Fan 2-2 Amps		111	106	109	120	120	110	109	98
ID Fan 2-1 Amps		245	240	242	254	255	242	241	222
ID Fan 2-2 Amps		246	244	244	261	260	247	246	230

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		365	366*	388	389	390	391	392	393
Test Data	1982	9/30	10/1	10/13	10/13	10/13	10/13	10/13	10/13
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		45	44	53	55	58	56	58	62
FD 2-1 Fan Outlet		65	65	64	66	68	70	72	74
FD 2-2 Fan Outlet		65	64	62	65	67	69	70	73
Stm. AH 2-1 Air Outlet		129	132	101	102	102	102	101	101
Stm. AH 2-2 Air Outlet		113	112	95	94	94	95	94	94
AH 2-1 Air Inlet		125	127	98	98	99	99	99	100
AH 2-2 Air Inlet		108	108	89	89	89	89	90	90
AH 2-1 Air Outlet		430	429	492	494	494	494	494	492
AH 2-2 Air Outlet		442	442	508	508	509	508	509	507
AH 2-1 Gas Inlet		497	500	602	604	604	604	604	602
AH 2-2 Gas Inlet		525	527	642	645	645	645	643	643
AH 2-1 Gas Outlet		225	229	259	260	259	259	259	259
AH 2-2 Gas Outlet		244	248	266	267	265	268	267	266
Steam & Water, Degrees F									
Feedwater to Economizer		409	410	465	465	465	465	464	463
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		663	663	674	674	675	675	675	677
Desuperheater Inlet L		731	734	735	738	736	728	724	733
Desuperheater Inlet R		734	732	736	740	738	738	736	735
Desuperheater Outlet L		703	695	722	721	725	723	729	725
Desuperheater Outlet R		704	697	724	723	727	725	730	727
Throttle Steam		1003	1008	997	999	1002	1000	1003	999
Reheat-Cold at Turbine		564	570	633	635	638	635	637	633
Reheat Atemp Inlet L		558	565	629	630	633	630	632	628
Reheat Atemp Inlet R		554	566	629	631	634	631	633	629
Reheat Boiler Outlet		969	977	1008	1016	1012	1010	1005	993
HP EXTR Steam Inlet		562	569	633	634	637	634	636	632
HP FW Heater Inlet		363	363	413	413	414	414	413	413
HP FW Heater Drain		360	360	417	417	417	417	417	416
Auxiliary Steam		607	606	545	541	542	545	547	548
Miscellaneous									
Burner Tilt LR ± Deg		20	10	20	12	5	0	-5	17
Burner Tilt LF ± Deg		19	-10	19	12	5	0	-6	17
Burner Tilt RF ± Deg		19	9	19	11	5	0	-5	16
Burner Tilt RR ± Deg		20	11	20	12	6	0	-5	18
Flue Gas Oxygen R		4.0	4.7	3.9	3.1	3.1	3.1	3.3	3.3
Flue Gas Oxygen L		3.6	3.4	3.1	3.6	3.8	3.6	3.8	3.3
Flue GAs Oxygen Avg.		3.8	4.1	3.5	3.3	3.5	3.3	3.6	3.3
Drum Level "H_2O		2.3	2.1	2.3	1.9	1.9	1.8	2.0	2.3
FD Fan 2-1 Amps		96	97	119	118	118	118	117	117
FD Fan 2-2 Amps		95	96	120	119	118	119	118	118
ID Fan 2-1 Amps		216	215	254	255	252	255	255	254
ID Fan 2-2 Amps		225	225	256	258	256	260	257	257

* Summary and Emissions data only for tests 367-387 and 394-401

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		402*	404*
Test Data	1982	10/15	10/15
TEMPERATURES			
Air & Gas, Degrees F			
Ambient Air		62	62
FD 2-1 Fan Outlet		76	77
FD 2-2 Fan Outlet		75	76
Stm. AH 2-1 Air Outlet		103	103
Stm. AH 2-2 Air Outlet		94	94
AH 2-1 Air Inlet		102	102
AH 2-2 Air Inlet		93	93
AH 2-1 Air Outlet		492	492
AH 2-2 Air Outlet		508	508
AH 2-1 Gas Inlet		597	599
AH 2-2 Gas Inlet		641	641
AH 2-1 Gas Outlet		258	258
AH 2-2 Gas Outlet		266	265
Steam & Water, Degrees F			
Feedwater to Economizer		459	459
Economizer Outlet		NA	NA
Boiler Downcomer		673	674
Desuperheater Inlet L		744	745
Desuperheater Inlet R		742	744
Desuperheater Outlet L		713	712
Desuperheater Outlet R		716	713
Throttle Steam		998	997
Reheat-Cold at Turbine		621	621
Reheat Atemp Inlet L		616	608
Reheat Atemp Inlet R		618	612
Reheat Boiler Outlet		1007	1007
HP EXTR Steam Inlet		621	620
HP FW Heater Inlet		408	408
HP FW Heater Drain		411	411
Auxiliary Steam		576	575
Miscellaneous			
Burner Tilt LR ± Deg		18	18
Burner Tilt LF ± Deg		18	17
Burner Tilt RF ± Deg		17	16
Burner Tilt RR ± Deg		19	18
Flue Gas Oxygen R		3.6	3.4
Flue Gas Oxygen L		3.0	3.0
Flue GAs Oxygen Avg.		3.3	3.2
Drum Level "H_2O		2.2	2.2
FD Fan 2-1 Amps		114	114
FD Fan 2-2 Amps		114	113
ID Fan 2-1 Amps		251	252
ID Fan 2-2 Amps		254	255

* Summary and Emissions data only for tests 403 and 405

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		504*	505	506	507	508	509*	510	511
Date	1983	3/18	3/18	3/18	3/18	3/18	1/19	3/19	3/19
FLOWS, 10E3 LB/HR									
Air Flow		2350	2350	2278	2308	2322	-	2441	2441
Feedwater		2215	2172	2203	2202	2177	-	2218	2218
Main Steam		2219	2217	2215	2210	2214	-	2557	2557
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		58	62	59	58	59	-	56	56
Stm. AH Extr.		16	15	14	14	16	-	21	21
Stm. AH Aux.		33	33	33	33	33	-	31	31
Condensate Flow		1932	1949	2007	1966	1990	-	2022	2022
Superheat Spray L		68	70	59	67	75	-	84	84
Superheat Spray R		63	65	58	67	73	-	81	81
Reheat Spray		0	0	0	0	0	-	0	0
PRESSURES									
Steam & Water, Psig									
Boiler Drum		2564	2567	2572	2570	2567	-	2579	2579
Throttle Steam		2398	2399	2404	2402	2403	-	2406	2406
Turbine 1st Stage		1341	1377	1337	1339	1334	-	1372	1372
Turbine Cold Reheat		439	440	438	437	440	-	446	446
Reheat Inlet		406	408	406	405	408	-	414	414
Extr. Steam (HP-FW)		434	435	432	432	434	-	440	440
Main Steam		2415	2417	2421	2418	2417	-	2420	2421
Aux. Steam		341	342	342	340	341	-	343	343
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		5.2	5.6	5.6	5.7	5.7	5.2	6.4	6.2
FD Fan 2-2 Discharge		5.7	6.2	6.2	6.2	6.2	5.6	6.6	6.5
AH 2-1 Air Diff.		1.4	1.5	1.5	1.4	1.4	-	1.5	1.5
AH 2-2 Air Diff.		1.9	2.0	2.0	1.9	1.9	-	2.2	2.2
Windbox Pressure L		2.6	2.6	2.8	2.5	2.6	1.9	2.7	3.0
Windbox Pressure R		2.4	2.4	2.7	2.5	2.6	1.8	2.5	2.8
WB/Furn. Diff. L		3.0	3.3	3.2	3.1	3.0	2.5	3.4	3.5
WB/Furn. Diff. R		3.2	3.4	3.4	3.3	3.0	2.5	3.2	3.5
Furnace Draft		-0.6	-0.5	-0.5	-0.9	-0.5	-	-0.4	-0.4
SH Draft Diff.		1.1	1.1	1.1	1.1	1.0	-	1.1	1.1
Econ. Draft Diff.		1.7	1.7	1.7	1.7	1.6	-	1.7	1.7
AH 2-1 Gas Diff.		7.3	7.5	7.3	7.3	7.2	6.8	7.5	7.5
AH 2-2 Gas Diff.		7.7	8.0	7.7	7.7	7.7	7.3	8.0	8.0
ID Fan 2-1 Inlet		-9.3	-9.2	-8.8	-9.4	-9.1	-	-9.5	-9.5
ID FAn 2-2 Inlet		-9.6	-9.4	-9.0	-9.9	-9.3	-	-9.7	-9.7
Atm. Barometric "Hg		24.0	24.0	24.0	24.0	24.0	-	24.2	24.2

* Only Board, Emissions and Limited Computer Data Available

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		512	513	514	515	516	517	518	519
Date	1983	3/21	3/21	3/21	3/21	3/21	1/21	3/22	3/22
FLOWS, 10E3 LB/HR									
Air Flow		2273	2377	2439	2642	2625	2444	3163	3271
Feedwater		2246	2206	2295	2280	2275	2309	3016	2981
Main Steam		2269	2259	2273	2267	2273	2279	2930	2933
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		55	56	56	58	59	58	45	47
Stm. AH Extr.		21	21	21	28	26	24	37	37
Stm. AH Aux.		30	30	31	30	31	30	25	25
Condensate Flow		2010	1949	2018	2052	2050	2037	2658	2683
Superheat Spray L		88	74	54	64	79	53	73	82
Superheat Spray R		82	70	50	58	75	47	69	75
Reheat Spray		0	0	0	0	0	0	43	51
PRESSURES									
Steam & Water, Psig									
Boiler Drum		2570	2582	2577	2573	2579	2578	2673	2683
Throttle Steam		2399	2407	2401	2400	2406	2402	2393	2403
Turbine 1st Stage		1374	1375	1374	1374	1378	1377	1815	1824
Turbine Cold Reheat		450	450	449	450	450	447	598	603
Reheat Inlet		418	417	417	418	417	415	555	560
Extr. Steam (HP-FW)		444	444	443	444	443	441	589	594
Main Steam		2415	2427	2421	2418	2423	2419	2423	2432
Aux. Steam		342	343	342	342	343	342	343	342
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		6.0	6.8	6.5	8.0	9.3	7.0	10.4	10.4
FD Fan 2-2 Discharge		6.5	7.4	6.7	8.4	9.6	7.3	10.7	10.7
AH 2-1 Air Diff.		1.4	1.5	1.6	2.0	1.7	1.7	2.7	2.8
AH 2-2 Air Diff.		2.3	2.3	2.2	2.8	2.7	2.4	3.6	3.8
Windbox Pressure L		2.8	3.2	2.6	3.0	5.5	3.4	4.3	4.8
Windbox Pressure R		2.6	3.0	2.5	3.4	5.3	3.2	4.3	4.7
WB/Furn. Diff. L		3.6	4.0	3.6	4.4	6.5	4.1	5.0	5.2
WB/Furn. Diff. R		3.6	4.0	3.7	4.4	6.5	4.1	5.0	5.2
Furnace Draft		-0.5	-0.3	-0.9	-0.6	-0.4	-0.4	-0.8	-0.7
SH Draft Diff.		1.1	1.1	1.1	1.3	1.3	1.1	2.0	2.0
Econ. Draft Diff.		1.7	1.7	1.9	2.1	2.0	1.8	2.9	2.8
AH 2-1 Gas Diff.		7.7	7.3	8.2	8.7	8.5	8.1	11.6	12.3
AH 2-2 Gas Diff.		8.2	7.5	8.4	8.9	8.7	8.3	11.8	12.6
ID Fan 2-1 Inlet		-9.3	-9.2	-10.5	-11.2	-10.9	-10.1	-14.5	-15.1
ID FAn 2-2 Inlet		-9.5	-9.3	-10.9	-11.6	-10.8	-10.1	-15.0	-15.5
Atm. Barometric "Hg		24.2	24.2	24.2	24.2	24.2	24.2	24.2	24.2

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		520	521	522	523	524	525	526	527
Date	1983	3/22	3/22	3/23	3/23	3/23	1/23	3/23	3/23
FLOWS, 10E3 LB/HR									
Air Flow		3224	3290	2443	2503	2388	2497	2416	2662
Feedwater		3063	2945	2231	2168	2289	2112	2200	2192
Main Steam		2946	2932	2216	2219	2243	2214	2237	2251
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		49	50	49	48	49	50	49	47
Stm. AH Extr.		36	36	29	28	28	29	28	29
Stm. AH Aux.		25	25	24	24	25	25	24	24
Condensate Flow		2587	2686	1982	2022	1981	2011	1981	2081
Superheat Spray L		25	74	56	82	55	117	83	90
Superheat Spray R		24	72	45	72	39	120	78	86
Reheat Spray		0	48	0	33	0	41	41	35
PRESSURES									
Steam & Water, Psig									
Boiler Drum		2696	2690	2555	2565	2573	2551	2576	2559
Throttle Steam		2406	2407	2391	2408	2409	2394	2414	2394
Turbine 1st Stage		1826	1828	1343	1340	1353	1344	1347	1359
Turbine Cold Reheat		595	604	439	442	440	446	448	449
Reheat Inlet		553	561	408	411	408	415	416	417
Extr. Steam (HP-FW)		586	595	433	437	435	442	443	444
Main Steam		2435	2435	2406	2420	2422	2207	2427	2410
Aux. Steam		340	344	341	341	342	343	340	341
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		10.1	10.1	7.0	7.0	7.0	7.5	7.5	7.5
FD Fan 2-2 Discharge		10.3	10.6	7.5	7.5	7.5	8.0	8.0	8.0
AH 2-1 Air Diff.		2.8	2.6	1.7	1.6	1.6	1.6	1.6	2.0
AH 2-2 Air Diff.		3.6	3.6	2.5	2.5	2.4	2.4	2.6	3.0
Windbox Pressure L		4.5	4.5	3.5	4.0	3.5	3.5	4.0	3.5
Windbox Pressure R		4.5	4.5	3.5	4.0	3.5	3.5	4.0	3.5
WB/Furn. Diff. L		5.1	5.1	4.5	4.5	4.5	4.5	4.5	4.5
WB/Furn. Diff. R		5.2	5.3	4.5	4.5	4.5	4.5	4.5	4.5
Furnace Draft		-0.7	-0.6	-0.3	-0.7	-0.5	-0.7	-1.0	-0.5
SH Draft Diff.		1.9	2.0	1.1	1.1	1.1	1.1	1.1	1.2
Econ. Draft Diff.		2.9	2.8	1.8	1.8	1.7	1.8	1.8	2.0
AH 2-1 Gas Diff.		11.8	11.8	7.5	7.5	7.5	7.5	7.5	8.5
AH 2-2 Gas Diff.		12.2	12.3	8.0	8.0	8.0	8.5	8.5	9.0
ID Fan 2-1 Inlet		-15.0	-14.7	-9.2	-9.4	-8.5	-9.6	-9.8	-10.6
ID FAn 2-2 Inlet		-15.6	-15.3	-10.0	-10.3	-9.4	-10.2	-10.5	-11.4
Atm. Barometric "Hg		24.2	24.2	24.3	24.3	24.3	24.3	24.3	24.3

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		528	529	530	531	532	533	534*	535
Date	1983	3/23	3/23	3/24	3/24	3/24	1/24	3/25	3/28
FLOWS, 10E3 LB/HR									
Air Flow		2734	2627	1786	1740	1763	1775	2150	2100
Feedwater		2151	2139	1401	1386	1421	1389	1900	2070
Main Steam		2243	2242	1384	1382	1384	1386	2000	2150
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		48	47	65	66	67	68	-	-
Stm. AH Extr.		31	29	0	0	0	0	-	-
Stm. AH Aux.		25	24	40	40	41	40	-	-
Condensate Flow		1961	2075	1311	1261	1300	1300	-	-
Superheat Spray L		99	124	38	36	41	48	135	120
Superheat Spray R		88	104	32	33	41	49	125	106
Reheat Spray		34	42	17	16	18	16	-	-
PRESSURES									
Steam & Water, Psig									
Boiler Drum		2567	2562	2469	2466	2468	2475	2560	2570
Throttle Steam		2402	2401	2397	2394	2395	2403	2420	2410
Turbine 1st Stage		1360	1355	808	802	803	803	-	-
Turbine Cold Reheat		450	450	262	262	264	263	-	-
Reheat Inlet		418	418	244	244	246	246	-	-
Extr. Steam (HP-FW)		445	445	259	259	261	261	-	-
Main Steam		2418	2415	2406	2399	2400	2408	-	-
Aux. Steam		341	343	341	342	341	342	-	-
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		7.5	7.5	4.0	4.0	4.5	4.0	6.5	6.6
FD Fan 2-2 Discharge		8.0	8.0	4.0	4.0	4.5	4.0	6.5	7.2
AH 2-1 Air Diff.		2.0	1.9	0.9	1.0	1.0	1.0	-	-
AH 2-2 Air Diff.		3.1	2.7	1.4	1.3	1.4	1.4	-	-
Windbox Pressure L		3.5	3.5	2.0	2.0	2.0	2.0	3.0	3.5
Windbox Pressure R		3.5	3.5	2.0	2.0	2.0	2.0	3.0	3.4
WB/Furn. Diff. L		4.5	4.5	3.0	3.0	2.5	2.5	3.5	4.0
WB/Furn. Diff. R		4.5	4.5	3.0	3.0	2.5	2.5	3.5	4.0
Furnace Draft		-0.6	-0.9	-0.7	-0.7	-0.7	-0.5	-0.5	-0.6
SH Draft Diff.		1.3	1.3	0.6	0.6	0.6	0.5	-	-
Econ. Draft Diff.		2.1	2.0	1.0	1.0	1.0	1.0	-	-
AH 2-1 Gas Diff.		8.5	8.5	5.0	5.0	5.0	5.0	8.0	7.6
AH 2-2 Gas Diff.		9.0	9.0	5.0	5.0	5.0	5.0	8.0	7.6
ID Fan 2-1 Inlet		-11.0	-10.6	-6.1	-6.0	-6.0	-5.7	-11.0	-9.5
ID FAn 2-2 Inlet		-11.7	-11.1	-6.2	-6.2	-6.1	-5.9	-11.0	-9.5
Atm. Barometric "Hg		24.2	24.2	24.3	24.3	24.3	24.3	24.0	24.4

* Only Board and Emissions data available for tests 534-545

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		536	537	538	539	540	541	542	543
Date	1983	3/28	3/28	3/28	3/28	3/28	3/28	3/29	3/29
FLOWS, 10E3 LB/HR									
Air Flow		2100	2000	2050	2050	2000	2050	2070	2100
Feedwater		2070	2250	2100	2100	2100	2150	2250	2250
Main Steam		2100	2150	2150	2150	2100	2100	2250	2250
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		-	-	-	-	-	-	-	-
Stm. AH Extr.		-	-	-	-	-	-	-	-
Stm. AH Aux.		-	-	-	-	-	-	-	-
Condensate Flow		-	-	-	-	-		-	-
Superheat Spray L		90	70	72	59	80	99	56	100
Superheat Spray R		95	75	60	53	75	92	49	96
Reheat Spray		-	-	-	-	-	-	-	-
PRESSURES									
Steam & Water, Psig									
Boiler Drum		2540	2560	2560	2580	2550	2560	2570	2550
Throttle Steam		2405	2410	2410	2410	2410	2410	2410	2410
Turbine 1st Stage		-	-	-	-	-	-	-	-
Turbine Cold Reheat		-	-	-	-	-	-	-	-
Reheat Inlet		-	-	-	-	-	-	-	-
Extr. Steam (HP-FW)		-	-	-	-	-	-	-	-
Main Steam		-	-	-	-	-	-	-	-
Aux. Steam		-	-	-	-	-	-	-	-
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		7.0	5.4	5.0	5.4	6.3	6.5	7.7	7.3
FD Fan 2-2 Discharge		7.5	5.7	5.5	7.1	6.7	7.0	8.2	7.6
AH 2-1 Air Diff.		-	-	-	-	-	-	-	-
AH 2-2 Air Diff.		-	-	-	-	-	-	-	-
Windbox Pressure L		3.5	2.4	2.1	3.6	3.0	3.0	3.5	3.6
Windbox Pressure R		3.5	2.4	2.1	3.6	3.0	3.0	3.5	3.5
WB/Furn. Diff. L		4.5	3.3	2.7	4.0	3.9	4.0	4.4	4.4
WB/Furn. Diff. R		4.7	3.5	2.9	4.2	4.1	4.2	4.6	4.4
Furnace Draft		-1.1	-1.0	-0.7	-0.5	-1.0	-1.1	-1.0	-0.8
SH Draft Diff.		-	-	-	-	-	-	-	-
Econ. Draft Diff.		-	-	-	-	-	-	-	-
AH 2-1 Gas Diff.		7.7	7.4	7.5	8.0	6.6	7.2	8.2	8.1
AH 2-2 Gas Diff.		7.7	7.4	7.5	8.1	6.6	7.2	7.7	8.0
ID Fan 2-1 Inlet		-9.5	-9.0	-9.5	-9.5	-8.5	-8.5	-10.1	-10.1
ID FAn 2-2 Inlet		-9.5	-9.5	-9.5	-9.5	-8.5	-8.5	-9.8	-9.9
Atm. Barometric "Hg		24.4	24.4	24.4	24.3	24.3	24.4	24.5	24.5

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		544	545
Date	1983	3/29	3/29
FLOWS, 10E3 LB/HR			
Air Flow		2070	2070
Feedwater		2100	2100
Main Steam		2150	2150
Reheat Steam		NA	NA
Auxiliary Steam		-	-
Stm. AH Extr.		-	-
Stm. AH Aux.		-	-
Condensate Flow		-	-
Superheat Spray L		112	112
Superheat Spray R		116	114
Reheat Spray		-	-
PRESSURES			
Steam & Water, Psig			
Boiler Drum		2560	2550
Throttle Steam		2410	2410
Turbine 1st Stage		-	-
Turbine Cold Reheat		-	-
Reheat Inlet		-	-
Extr. Steam (HP-FW)		-	-
Main Steam		-	-
Aux. Steam		-	-
Air & Gas, "H_2O			
FD Fan 2-1 Discharge		6.9	7.1
FD Fan 2-2 Discharge		7.5	7.5
AH 2-1 Air Diff.		-	-
AH 2-2 Air Diff.		-	-
Windbox Pressure L		3.5	3.7
Windbox Pressure R		3.5	3.6
WB/Furn. Diff. L		4.2	4.3
WB/Furn. Diff. R		4.3	4.3
Furnace Draft		-0.7	-0.6
SH Draft Diff.		-	-
Econ. Draft Diff.		-	-
AH 2-1 Gas Diff.		7.4	7.6
AH 2-2 Gas Diff.		7.3	7.6
ID Fan 2-1 Inlet		-9.5	-9.6
ID FAn 2-2 Inlet		-9.3	-9.6
Atm. Barometric "Hg		24.5	24.5

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		504*	505	506	507	508	509*	510*	511
Date	1983	3/18	3/18	3/18	3/18	3/18	3/21	3/21	3/21
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		50	50	50	50	50	50	53	53
FD Fan 2-1 Outlet		100	100	100	100	100	100	98	98
FD Fan 2-2 Inlet		55	55	55	55	55	52	55	55
FD Fan 2-2 Outlet		100	100	100	100	100	96	98	96
ID Fan 2-1 Inlet		73	77	75	74	77	70	74	78
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		68	71	67	69	71	67	69	71
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		40	38	35	37	40	40	41	42
SH Spray R		40	40	40	40	44	42	44	45
RH Spray		0	0	0	0	5	0	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		55	55	54	55	56	55	57	57
Coal Flow 2-2		61	61	60	60	61	61	62	62
Coal Flow 2-3		56	56	55	55	56	54	57	57
Coal Flow 2-4		56	56	56	56	57	55	58	58
Coal Flow 2-5		58	58	57	58	55	53	56	56
Coal Air Temp. 2-1, °F		161	162	162	162	162	-	161	161
Coal Air Temp. 2-2		155	156	156	157	156	-	156	156
Coal Air Temp. 2-3		161	162	162	162	162	-	161	161
Coal Air Temp. 2-4		160	161	161	161	161	-	161	161
Coal Air Temp. 2-5		162	163	162	162	163	-	161	161
Mill 2-1	Amps	65	64	64	64	65	-	65	65
Mill 2-2		66	66	66	65	66	-	66	66
Mill 2-3		69	68	68	69	69	-	69	69
Mill 2-4		64	64	64	65	64	-	64	64
Mill 2-5		67	68	67	67	67	-	67	67
Exh. Discharge	"H_2O								
Mill 2-1		8.3	8.3	8.2	8.3	8.2	8.3	8.4	8.5
Mill 2-2		6.9	7.8	6.7	6.8	6.7	6.8	7.2	7.0
Mill 2-3		7.3	7.0	7.0	7.2	7.0	7.0	7.1	7.0
Mill 2-4		7.0	7.0	6.7	7.0	6.7	7.0	7.0	6.5
Mill 2-5		7.0	7.0	6.7	6.9	6.7	7.0	6.8	6.7
Diff. Press. 2-1	"H_2O	6.5	6.4	6.5	6.5	6.5	6.6	6.6	6.5
Diff. Press. 2-2		5.4	5.5	5.5	5.5	5.5	5.7	5.7	5.5
Diff. Press. 2-3		7.8	7.7	7.7	7.6	7.6	7.8	7.8	8.0
Diff. Press. 2-4		6.3	6.3	6.3	6.4	6.3	6.4	6.5	6.5
Diff. Press. 2-5		7.0	7.1	7.1	7.1	7.1	7.2	7.2	7.0
Mill 2-1 Suction		-2.7	-2.7	-2.7	-2.6	-2.6	-2.6	-2.6	-2.6
Mill 2-2 Suction		-2.5	-2.5	-2.5	-2.5	-2.4	-2.5	-2.4	-2.4
Mill 2-3 Suction		-2.6	-2.6	-2.5	-2.6	-2.7	-2.5	-2.5	-2.5
Mill 2-4 Suction		-2.5	-2.4	-2.5	-2.5	-2.4	-2.5	-2.4	-2.4
Mill 2-5 Suction		-2.6	-2.5	-2.5	-2.5	-2.6	-2.6	-2.5	-2.6
Mill 2-2 Feeder Speed % Full		61	60	60	61	63	-	-	64
Mill 2-2 Feeder Speed		61	62	62	62	63	-	-	64
Mill 2-3 Feeder Speed		61	62	62	62	63	-	-	66
Mill 2-4 Feeder Speed		62	62	62	62	63	-	-	66
Mill 2-5 Feeder Speed		65	65	66	65	63	-	-	66

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		512	513	514	515	516	517	518	519
Date	1983	3/21	3/21	3/21	3/21	3/21	3/21	3/22	3/22
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		52	52	53	56	57	54	65	65
FD Fan 2-1 Outlet		98	98	98	98	98	98	100	100
FD Fan 2-2 Inlet		54	54	56	59	59	56	67	67
FD Fan 2-2 Outlet		96	96	96	96	96	96	100	100
ID Fan 2-1 Inlet		73	72	73	76	77	74	87	87
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		68	66	68	71	72	68	83	83
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		44	39	34	37	36	32	36	35
SH Spray R		45	42	38	38	40	37	40	40
RH Spray		0	6	1	3	1	0	37	58
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		57	56	57	57	57	56	75	74
Coal Flow 2-2		62	62	62	62	62	62	82	82
Coal Flow 2-3		57	57	57	57	56	57	71	75
Coal Flow 2-4		58	57	58	58	57	57	75	74
Coal Flow 2-5		56	55	56	56	55	55	74	73
Coal Air Temp. 2-1, °F		161	162	161	162	163	161	162	162
Coal Air Temp. 2-2		156	155	156	157	157	156	157	156
Coal Air Temp. 2-3		161	161	161	162	162	160	161	161
Coal Air Temp. 2-4		160	161	161	162	163	158	160	160
Coal Air Temp. 2-5		161	161	161	161	162	160	162	161
Mill 2-1	Amps	66	66	64	65	65	64	68	67
Mill 2-2		66	66	66	66	66	66	71	71
Mill 2-3		70	70	70	71	70	69	75	75
Mill 2-4		64	64	65	65	65	65	70	69
Mill 2-5		68	67	67	68	68	67	72	71
Exh. Discharge	"H_2O								
Mill 2-1		8.2	8.2	8.3	8.4	8.5	8.4	9.7	9.3
Mill 2-2		6.8	6.8	7.0	7.0	7.0	6.8	7.3	7.5
Mill 2-3		7.2	7.0	7.3	7.3	7.3	7.3	7.3	8.0
Mill 2-4		7.3	7.0	7.3	7.2	6.8	7.2	7.6	7.5
Mill 2-5		7.0	6.8	7.2	7.2	6.7	7.2	7.6	7.6
Diff. Press. 2-1	"H_2O	6.7	6.6	6.5	6.6	6.7	6.5	6.3	6.2
Diff. Press. 2-2		5.7	5.7	5.6	5.7	5.7	5.7	6.2	6.2
Diff. Press. 2-3		7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.7
Diff. Press. 2-4		6.5	6.5	7.0	6.5	6.5	6.4	6.8	6.8
Diff. Press. 2-5		7.2	7.3	7.2	7.3	7.3	7.3	7.2	7.2
Mill 2-1 Suction		-2.6	-2.5	-2.6	-2.5	-2.3	-2.6	-2.2	-2.2
Mill 2-2 Suction		-2.6	-2.4	-2.6	-2.4	-2.2	-2.5	-2.1	-2.0
Mill 2-3 Suction		-2.6	-2.5	-2.6	-2.4	-2.3	-2.6	-2.1	-2.2
Mill 2-4 Suction		-2.5	-2.3	-2.5	-2.3	-2.3	-2.4	-1.9	-2.0
Mill 2-5 Suction		-2.7	-2.6	-2.7	-2.5	-2.4	-2.6	-2.2	-2.2
Mill 2-2 Feeder Speed % Full		64	64	64	63	63	63	83	83
Mill 2-2 Feeder Speed		64	64	64	64	64	64	83	83
Mill 2-3 Feeder Speed		66	64	64	64	64	64	80	83
Mill 2-4 Feeder Speed		66	64	65	64	64	64	84	83
Mill 2-5 Feeder Speed		66	64	64	64	64	84	84	83

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		520	521	522	523	524	525	526	527
Date	1983	3/22	3/22	3/23	3/23	3/23	3/23	3/23	3/23
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		65	65	55	56	54	56	56	58
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		67	67	58	57	56	58	58	60
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		87	85	72	74	74	74	78	76
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		83	81	72	74	74	74	78	76
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		20	30	40	44	38	60	50	50
SH Spray R		25	36	40	44	38	60	54	50
RH Spray		7	47	0	24	0	38	36	20
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		73	74	70	69	69	69	70	72
Coal Flow 2-2		80	81	77	76	76	76	76	79
Coal Flow 2-3		73	75	71	69	70	70	70	72
Coal Flow 2-4		73	74	70	69	70	70	70	72
Coal Flow 2-5		72	73	0	0	0	0	0	0
Coal Air Temp. 2-1, °F		162	161	161	162	161	161	162	161
Coal Air Temp. 2-2		157	156	156	157	157	157	157	156
Coal Air Temp. 2-3		161	163	160	161	161	161	162	161
Coal Air Temp. 2-4		161	159	160	161	161	161	162	161
Coal Air Temp. 2-5		161	161	-	-	-	-	-	-
Mill 2-1	Amps	66	66	65	66	65	65	66	66
Mill 2-2		71	70	69	70	69	68	69	70
Mill 2-3		74	74	73	73	73	74	74	74
Mill 2-4		69	68	69	67	68	67	67	70
Mill 2-5		71	71	0	0	0	0	0	0
Exh. Discharge	"H_2O								
Mill 2-1		9.6	9.8	9.5	9.0	9.0	9.5	9.0	9.5
Mill 2-2		7.2	7.3	7.5	7.0	7.0	7.5	7.0	7.5
Mill 2-3		7.7	8.2	8.0	8.0	7.0	8.0	7.5	8.0
Mill 2-4		7.3	7.4	8.0	7.5	7.5	7.5	7.5	7.5
Mill 2-5		7.2	7.5	-	-	-	-	-	-
Diff. Press. 2-1	"H_2O	6.2	6.2	6.5	6.5	6.5	6.5	6.5	6.5
Diff. Press. 2-2		6.2	6.2	6.5	6.5	6.0	6.0	6.0	6.0
Diff. Press. 2-3		8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Diff. Press. 2-4		6.8	6.7	6.5	6.5	6.5	6.5	6.5	7.5
Diff. Press. 2-5		7.2	7.2	0	0	0	0	0	0
Mill 2-1 Suction		-2.0	-2.1	-2.2	-2.2	-2.2	-2.4	-2.2	-2.1
Mill 2-2 Suction		-2.1	-2.1	-2.3	-2.4	-2.4	-2.2	-2.1	-2.2
Mill 2-3 Suction		-2.0	-1.8	-2.0	-2.0	-2.0	-2.2	-2.0	-2.0
Mill 2-4 Suction		-2.1	-2.2	-1.5	-1.5	-1.5	-1.5	-1.1	-1.1
Mill 2-5 Suction		80	83	80	80	80	80	80	80
Mill 2-2 Feeder Speed % Full		81	84	80	80	80	80	80	80
Mill 2-2 Feeder Speed		82	85	80	80	80	80	80	80
Mill 2-3 Feeder Speed		81	85	80	80	80	80	80	80
Mill 2-4 Feeder Speed		81	84	-	-	-	-	-	-
Mill 2-5 Feeder Speed		66	64	64	64	64	84	84	83

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		528	529	530	531	532	533	534*	535
Date	1983	3/23	3/23	3/24	3/24	3/24	3/24	3/25	3/28
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		58	58	44	44	44	44	52	54
FD Fan 2-1 Outlet		100	100	88	86	86	88	100	100
FD Fan 2-2 Inlet		60	60	44	44	44	44	52	56
FD Fan 2-2 Outlet		100	100	88	86	86	88	100	100
ID Fan 2-1 Inlet		80	78	62	58	58	60	72	73
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		78	78	52	52	52	54	64	66
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		50	60	36	32	38	40	50	60
SH Spray R		50	60	36	36	44	50	50	60
RH Spray		28	34	10	8	10	10	40	13
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		71	72	0	0	0	0	69	69
Coal Flow 2-2		77	79	63	64	65	62	75	77
Coal Flow 2-3		71	72	57	59	60	57	68	69
Coal Flow 2-4		70	72	58	59	61	58	69	69
Coal Flow 2-5		0	0	0	0	0	0	0	0
Coal Air Temp. 2-1, °F		161	161	-	-	-	-	160	160
Coal Air Temp. 2-2		156	156	156	156	156	156	155	154
Coal Air Temp. 2-3		161	161	161	160	161	161	150	154
Coal Air Temp. 2-4		161	161	161	160	161	160	154	155
Coal Air Temp. 2-5		-	-	-	-	-	-	-	155
Mill 2-1	**Amps**	66	67	0	0	0	0	70	70
Mill 2-2		70	69	65	67	66	66	80	75
Mill 2-3		74	74	69	69	69	70	82	78
Mill 2-4		67	68	65	66	65	64	74	72
Mill 2-5		0	0	0	0	0	0	0	54
Exh. Discharge	"H_2O								
Mill 2-1		9.0	9.5	-	-	-	-	9.0	10.0
Mill 2-2		7.0	7.5	7.0	7.0	7.0	7.0	7.0	7.5
Mill 2-3		7.5	8.0	7.5	7.5	7.5	8.0	7.5	7.8
Mill 2-4		8.0	7.5	7.0	7.0	7.0	7.0	7.5	7.8
Mill 2-5		-	-	-	-	-	-	-	2.5
Diff. Press. 2-1	"H_2O	6.5	6.5	-	-	-	-	6.5	6.5
Diff. Press. 2-2		6.0	6.5	6.0	5.5	6.0	6.0	6.0	6.0
Diff. Press. 2-3		8.0	8.0	8.0	7.5	8.0	8.0	7.5	7.5
Diff. Press. 2-4		6.5	6.5	6.5	7.0	6.5	6.5	6.5	6.5
Diff. Press. 2-5		-	-	-	-	-	-	-	3.0
Mill 2-1 Suction		-2.4	-2.2	-	-	-	-	-2.3	-2.2
Mill 2-2 Suction		-2.0	-2.0	-2.4	-2.4	-2.3	-2.4	-2.3	-2.0
Mill 2-3 Suction		-2.2	-2.1	-2.5	-2.5	-2.5	-2.6	-2.3	-2.2
Mill 2-4 Suction		-2.0	-1.8	-2.5	-2.5	-2.5	-2.6	-1.6	-2.0
Mill 2-5 Suction		80	80	-	-	-	-	82	78
Mill 2-2 Feeder Speed % Full		80	80	68	65	66	64	82	78
Mill 2-2 Feeder Speed		80	80	66	65	66	64	84	78
Mill 2-3 Feeder Speed		80	80	66	66	66	64	84	79
Mill 2-4 Feeder Speed		-	-	-	-	-	-	-	25
Mill 2-5 Feeder Speed		66	64	64	64	64	84	84	83

* Only Board and Emissions data available for tests 534-545

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		536	537	538	539	540	541	542	543
Date	1983	3/28	3/28	3/28	3/28	3/28	3/28	3/29	3/29
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		53	51	50	53	53	53	56	55
FD Fan 2-1 Outlet		100	100	88	86	86	88	100	100
FD Fan 2-2 Inlet		54	53	53	55	55	56	58	57
FD Fan 2-2 Outlet		100	100	88	86	86	88	100	100
ID Fan 2-1 Inlet		73	77	70	73	70	76	80	73
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		66	69	64	64	63	68	70	66
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		50	40	40	33	43	50	39	50
SH Spray R		50	42	41	34	42	53	40	53
RH Spray		13	6	4	5	8	6	7	15
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		63	55	0	0	0	0	59	71
Coal Flow 2-2		75	60	60	73	75	76	63	79
Coal Flow 2-3		66	55	55	66	68	69	60	70
Coal Flow 2-4		66	56	55	67	70	69	61	70
Coal Flow 2-5		0	53	53	65	68	67	60	0
Coal Air Temp. 2-1, °F		160	160	160	120	115	105	160	160
Coal Air Temp. 2-2		155	155	155	155	155	155	155	152
Coal Air Temp. 2-3		155	155	153	155	153	155	154	152
Coal Air Temp. 2-4		155	153	153	155	153	155	154	152
Coal Air Temp. 2-5		155	155	156	155	156	157	156	85
Mill 2-1	Amps	70	68	68	0	0	0	69	70
Mill 2-2		75	71	71	75	75	75	71	75
Mill 2-3		77	72	72	76	78	76	73	79
Mill 2-4		77	68	69	70	73	71	69	73
Mill 2-5		55	72	72	73	75	75	72	0
Exh. Discharge	"H_2O								
Mill 2-1		10.0	9.0	8.5	0	0	0	9.0	9.5
Mill 2-2		7.5	7.0	7.0	7.5	7.5	7.5	7.0	7.0
Mill 2-3		7.5	7.0	6.5	7.5	7.5	7.5	7.0	7.5
Mill 2-4		7.5	7.5	7.0	7.5	7.5	7.5	7.5	7.5
Mill 2-5		2.5	7.7	7.3	7.5	7.8	8.0	7.5	0
Diff. Press. 2-1	"H_2O	6.5	7.0	6.0	0	0	0	6.5	6.5
Diff. Press. 2-2		6.2	6.0	5.5	6.0	6.0	6.0	5.9	6.0
Diff. Press. 2-3		7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.6
Diff. Press. 2-4		6.5	7.0	6.2	6.5	6.3	6.3	6.4	7.5
Diff. Press. 2-5		3.5	7.5	7.0	7.5	7.6	7.6	7.5	0
Mill 2-1 Suction		-2.2	-2.7	-2.6	-1.5	-1.8	-1.4	-2.7	-2.2
Mill 2-2 Suction		-2.1	-2.7	-2.5	-2.2	-2.2	-2.1	-2.7	-2.1
Mill 2-3 Suction		-2.3	-2.7	-2.6	-2.2	-2.2	-2.1	-2.8	-2.0
Mill 2-4 Suction		-2.0	-2.6	-2.2	-2.2	-2.0	-1.9	-2.3	-1.8
Mill 2-5 Suction		-2.6	-2.7	-2.6	-2.3	-2.1	-2.1	-2.6	-1.2
Mill 2-2 Feeder Speed % Full		78	62	62	-	-	-	65	79
Mill 2-2 Feeder Speed		78	62	62	75	77	79	64	80
Mill 2-3 Feeder Speed		78	62	62	75	77	79	65	80
Mill 2-4 Feeder Speed		79	62	62	75	78	80	66	80
Mill 2-5 Feeder Speed		25	61	61	75	76	79	65	-

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		544	545
Date	1983	3/29	3/29
FAN DAMPER, % Open			
FD Fan 2-1 Inlet		55	55
FD Fan 2-1 Outlet		100	100
FD Fan 2-2 Inlet		57	57
FD Fan 2-2 Outlet		100	100
ID Fan 2-1 Inlet		74	78
ID Fan 2-1 Outlet		100	100
ID Fan 2-2 Inlet		67	70
ID Fan 2-2 Outlet		100	100
SPRAY VALVES, % Open			
SH Spray L		56	58
SH Spray R		59	61
RH Spray		13	15
MILL DATA			
Coal Flow 2-1 10E3 LB/HR		70	72
Coal Flow 2-2		78	80
Coal Flow 2-3		70	72
Coal Flow 2-4		70	72
Coal Flow 2-5		0	0
Coal Air Temp. 2-1, °F		159	159
Coal Air Temp. 2-2		154	154
Coal Air Temp. 2-3		153	154
Coal Air Temp. 2-4		153	153
Coal Air Temp. 2-5		90	80
Mill 2-1	Amps	70	70
Mill 2-2		75	75
Mill 2-3		79	78
Mill 2-4		73	72
Mill 2-5		0	0
Exh. Discharge	"H_2O		
Mill 2-1		9.8	9.5
Mill 2-2		7.6	7.5
Mill 2-3		7.8	7.7
Mill 2-4		7.6	7.9
Mill 2-5		0	0
Diff. Press. 2-1	"H_2O	6.5	6.2
Diff. Press. 2-2		6.0	6.0
Diff. Press. 2-3		7.5	7.5
Diff. Press. 2-4		7.5	7.0
Diff. Press. 2-5		0	0
Mill 2-1 Suction		-2.2	-2.3
Mill 2-2 Suction		-2.1	-2.1
Mill 2-3 Suction		-2.1	-2.3
Mill 2-4 Suction		-1.8	-2.1
Mill 2-5 Suction		-1.3	-1.4
Mill 2-2 Feeder Speed % Full		84	80
Mill 2-2 Feeder Speed		83	80
Mill 2-3 Feeder Speed		85	81
Mill 2-4 Feeder Speed		86	82
Mill 2-5 Feeder Speed		-	-

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		504*	505	506	507	508	509*	510	511
Test Date	1983	3/18	3/18	3/18	3/18	3/18	3/21	3/21	3/21
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		36	39	40	39	37	-	33	33
FD 2-1 Fan Outlet		54	59	60	62	61	-	53	53
FD-2-2 Fan Outlet		47	56	57	59	57	-	50	50
Stm. AH 2-1 Air Outlet		118	122	123	123	122	-	117	117
Stm. AH 2-2 Air Outlet		106	122	123	123	123	-	119	119
AH 2-1 Air Inlet		110	115	116	117	116	-	108	108
AH 2-2 Air Inlet		92	108	109	110	109	-	102	102
AH 2-1 Air Outlet		492	494	494	494	495	-	491	491
AH 2-2 Air Outlet		492	495	496	497	498	-	497	497
AH 2-1 Gas Inlet		580	586	584	582	583	-	580	580
AH 2-2 Gas Inlet		618	620	620	621	623	-	628	628
AH 2-1 Gas Outlet		281	283	282	282	283	-	275	275
AH 2-2 Gas Outlet		266	280	277	279	279	-	276	276
Steam & Water, Degrees F									
Feedwater to Economizer		457	458	457	457	458	-	458	458
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		676	676	677	678	677	-	676	676
Desuperheater Inlet L		719	736	736	739	740	-	740	740
Desuperheater Inlet R		733	734	733	736	734	-	739	732
Desuperheater Outlet L		703	704	706	707	705	-	703	703
Desuperheater Outlet R		704	705	708	708	706	-	705	705
Throttle Steam		966	995	996	1000	997	-	998	998
Reheat-Cold at Turbine		635	635	636	637	636	-	639	639
Reheat Atemp Inlet L		630	619	635	634	616	-	630	630
Reheat Atemp Inlet R		-	-	-	-	-	-	-	-
Reheat Boiler Outlet		1010	1012	1011	1012	1008	-	1014	1014
HP EXTR Steam Inlet		635	634	635	636	635	-	638	638
HP FW Heater Inlet		394	394	394	394	394	-	394	394
HP FW Heater Drain		407	408	408	408	408	-	409	409
Auxiliary Steam		601	602	603	605	600	-	602	602
Miscellaneous									
Burner Tilt LR ± Deg		19	16	15	14	17	-	17	17
Burner Tilt LF ± Deg		18	14	14	12	15	-	15	15
Burner Tilt RF ± Deg		20	16	16	14	17	-	17	17
Burner Tilt RR ± Deg		22	18	18	16	19	-	19	19
Flue Gas Oxygen R		311	3.4	3.4	3.8	3.5	-	3.9	3.9
Flue Gas Oxygen L		2.9	2.8	3.0	3.0	2.8	-	3.0	3.0
Flue Gas Oxygen Avg.		3.0	3.1	3.2	3.4	3.2	-	3.4	3.4
Drum Level "H_2O		0.0	0.3	0.0	-0.1	0.0	-	0.0	0.0
FD Fan 2-1 Amps		105	104	104	104	105	-	109	109
FD Fan 2-2 Amps		111	111	111	110	111	-	113	113
ID Fan 2-1 Amps		239	239	237	239	238	-	241	241
ID Fan 2-2 Amps		244	242	239	241	241	-	242	242

* Only Board, Emissions and Limited Computer Data Available

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		512	513	514	515	516	517	518	519
Test Date	1983	3/21	3/21	3/21	3/21	3/21	3/21	3/22	3/22
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		36	36	35	34	33	32	39	42
FD 2-1 Fan Outlet		53	54	54	53	53	53	52	55
FD-2-2 Fan Outlet		51	52	52	51	51	50	55	56
Stm. AH 2-1 Air Outlet		118	117	117	113	112	115	110	113
Stm. AH 2-2 Air Outlet		119	119	121	112	124	124	116	118
AH 2-1 Air Inlet		109	110	107	104	105	105	106	109
AH 2-2 Air Inlet		104	104	105	115	119	108	117	120
AH 2-1 Air Outlet		494	494	495	495	496	496	509	514
AH 2-2 Air Outlet		497	499	501	504	506	604	525	530
AH 2-1 Gas Inlet		581	582	587	596	599	588	632	639
AH 2-2 Gas Inlet		624	631	634	646	652	638	684	691
AH 2-1 Gas Outlet		277	277	279	275	275	278	281	286
AH 2-2 Gas Outlet		276	278	281	280	278	278	286	292
Steam & Water, Degrees F									
Feedwater to Economizer		459	459	459	459	459	458	484	485
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		675	675	675	675	675	675	684	685
Desuperheater Inlet L		739	739	731	749	750	742	734	744
Desuperheater Inlet R		739	739	738	749	745	739	735	740
Desuperheater Outlet L		699	707	712	713	712	714	714	716
Desuperheater Outlet R		700	708	714	714	714	715	716	717
Throttle Steam		998	997	1005	1000	998	1002	993	998
Reheat-Cold at Turbine		639	640	642	642	641	641	656	660
Reheat Atemp Inlet L		635	619	625	625	625	639	614	609
Reheat Atemp Inlet R		-	-	-	-	-	-	-	-
Reheat Boiler Outlet		1011	1011	1015	1014	1014	1011	1013	1021
HP EXTR Steam Inlet		638	640	640	641	640	640	655	658
HP FW Heater Inlet		395	395	395	395	395	394	416	417
HP FW Heater Drain		410	410	409	410	410	409	436	437
Auxiliary Steam		608	600	607	602	599	613	595	593
Miscellaneous									
Burner Tilt LR ± Deg		15	14	13	10	9	9	22	21
Burner Tilt LF ± Deg		14	13	12	9	8	8	21	20
Burner Tilt RF ± Deg		16	14	13	11	9	9	23	23
Burner Tilt RR ± Deg		18	17	16	13	12	12	25	25
Flue Gas Oxygen R		3.4	3.0	4.1	6.4	5.6	4.2	3.2	3.1
Flue Gas Oxygen L		2.9	3.0	3.0	3.0	3.0	3.1	3.2	3.1
Flue Gas Oxygen Avg.		3.1	3.0	3.5	4.7	4.3	3.6	3.2	3.1
Drum Level	"H_2O	0.0	-0.3	0.0	0.0	0.0	0.3	0.0	0.5
FD Fan 2-1	Amps	107	109	108	113	115	110	124	124
FD Fan 2-2	Amps	112	113	113	119	120	114	128	129
ID Fan 2-1	Amps	242	242	244	250	249	244	261	265
ID Fan 2-2	Amps	243	243	244	239	247	243	265	268

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		520	521	522	523	524	525	526	527
Test Date	1983	3/22	3/22	3/23	3/23	3/23	3/23	3/23	3/23
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		43	43	37	37	37	36	37	40
FD 2-1 Fan Outlet		59	59	53	55	55	54	56	57
FD-2-2 Fan Outlet		59	60	52	54	53	53	55	57
Stm. AH 2-1 Air Outlet		115	116	114	115	115	114	116	115
Stm. AH 2-2 Air Outlet		119	120	118	119	119	119	121	119
AH 2-1 Air Inlet		112	113	105	107	107	105	109	108
AH 2-2 Air Inlet		123	124	109	111	111	111	112	114
AH 2-1 Air Outlet		513	512	481	482	483	483	485	483
AH 2-2 Air Outlet		528	531	492	494	494	497	498	500
AH 2-1 Gas Inlet		635	641	580	585	579	588	585	595
AH 2-2 Gas Inlet		682	690	623	626	624	629	629	642
AH 2-1 Gas Outlet		288	284	262	263	263	261	264	263
AH 2-2 Gas Outlet		291	294	270	271	271	270	274	277
Steam & Water, Degrees F									
Feedwater to Economizer		483	485	456	458	457	460	459	459
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		686	682	676	676	677	675	677	677
Desuperheater Inlet L		731	743	734	736	732	752	743	753
Desuperheater Inlet R		729	738	740	740	738	743	741	751
Desuperheater Outlet L		727	719	711	704	713	693	703	705
Desuperheater Outlet R		729	719	713	705	716	694	707	707
Throttle Steam		995	1003	1002	1000	995	1005	998	998
Reheat-Cold at Turbine		655	664	643	642	636	649	640	642
Reheat Atemp Inlet L		639	617	626	583	634	571	556	577
Reheat Atemp Inlet R		-	-	-	-	-	-	-	-
Reheat Boiler Outlet		1009	1022	1009	1006	1005	1014	1009	1004
HP EXTR Steam Inlet		653	662	641	640	634	647	638	640
HP FW Heater Inlet		415	417	393	394	393	396	395	395
HP FW Heater Drain		436	437	407	408	407	409	409	410
Auxiliary Steam		609	603	612	595	597	595	583	589
Miscellaneous									
Burner Tilt LR ± Deg		21	21	14	19	9	23	17	13
Burner Tilt LF ± Deg		20	20	13	17	8	22	15	11
Burner Tilt RF ± Deg		23	22	14	20	9	24	18	13
Burner Tilt RR ± Deg		25	24	16	21	12	26	20	15
Flue Gas Oxygen R		3.5	3.0	3.1	2.9	3.2	2.8	3.6	6.1
Flue Gas Oxygen L		3.1	3.0	3.9	4.0	3.2	3.8	3.1	2.9
Flue Gas Oxygen Avg.		3.3	3.0	3.7	3.5	3.2	3.3	3.3	4.5
Drum Level	"H_2O	-0.2	0.5	-0.1	0.2	-0.5	0.2	-0.6	0.0
FD Fan 2-1	Amps	123	124	110	111	110	112	111	114
FD Fan 2-2	Amps	128	129	114	115	113	116	115	119
ID Fan 2-1	Amps	262	262	242	243	242	245	242	246
ID Fan 2-2	Amps	269	267	244	246	244	245	244	249

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		528	529	530	531	532	533	534*	535
Test Date	1983	3/23	3/23	3/24	3/24	3/24	3/24	3/25	3/28
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		41	40	29	29	27	25	-	-
FD 2-1 Fan Outlet		58	60	47	46	46	45	-	-
FD-2-2 Fan Outlet		57	59	46	45	45	45	-	-
Stm. AH 2-1 Air Outlet		114	117	114	116	117	116	-	-
Stm. AH 2-2 Air Outlet		118	120	128	132	133	131	-	-
AH 2-1 Air Inlet		107	111	111	111	111	111	-	-
AH 2-2 Air Inlet		115	118	100	111	104	105	-	-
AH 2-1 Air Outlet		484	487	439	437	436	436	-	-
AH 2-2 Air Outlet		500	499	443	442	443	443	-	-
AH 2-1 Gas Inlet		596	590	498	495	494	495	-	-
AH 2-2 Gas Inlet		640	637	544	543	547	547	-	-
AH 2-1 Gas Outlet		263	265	236	237	238	238	-	-
AH 2-2 Gas Outlet		275	273	244	250	251	250	-	-
Steam & Water, Degrees F									
Feedwater to Economizer		460	460	413	413	414	414	-	-
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		677	677	669	670	670	670	-	-
Desuperheater Inlet L		752	748	733	719	737	738	-	-
Desuperheater Inlet R		758	759	737	735	731	752	-	-
Desuperheater Outlet L		705	696	706	707	701	697	-	-
Desuperheater Outlet R		707	697	708	709	703	699	-	-
Throttle Steam		1000	996	990	989	992	993	1005	1005
Reheat-Cold at Turbine		643	641	609	608	612	612	-	-
Reheat Atemp Inlet L		580	562	557	563	554	558	-	-
Reheat Atemp Inlet R		-	-	-	-	-	-	-	-
Reheat Boiler Outlet		1006	1001	970	969	973	974	-	-
HP EXTR Steam Inlet		641	640	608	607	611	611	-	-
HP FW Heater Inlet		396	396	355	355	357	357	-	-
HP FW Heater Drain		410	410	363	363	365	365	-	-
Auxiliary Steam		590	583	617	624	627	623	-	-
Miscellaneous									
Burner Tilt LR ± Deg		12	20	26	26	24	24	23	22
Burner Tilt LF ± Deg		11	18	25	25	23	23	22	23
Burner Tilt RF ± Deg		13	20	27	27	25	25	24	24
Burner Tilt RR ± Deg		15	22	28	28	27	27	25	26
Flue Gas Oxygen R		6.5	5.2	5.5	5.6	4.7	4.5	3.4	2.9
Flue Gas Oxygen L		3.0	3.0	5.1	5.1	5.4	5.5	3.0	3.6
Flue Gas Oxygen Avg.		4.6	4.2	5.3	5.4	5.0	5.1	3.2	3.3
Drum Level	"H_2O	0.0	0.0	-0.2	0.0	-0.1	0.2	+0.2	+0.2
FD Fan 2-1	Amps	114	113	99	99	99	99	-	-
FD Fan 2-2	Amps	119	118	100	101	100	100	-	-
ID Fan 2-1	Amps	248	245	225	226	227	228	-	-
ID Fan 2-2	Amps	249	248	228	228	227	227	-	-

* Only Board and Emissions data available for tests 534-545

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		536	537	538	539	540	541	542	543
Test Date	1983	3/28	3/28	3/28	3/28	3/28	3/28	3/29	3/29
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		-	40	40	40	40	40	37	40
FD 2-1 Fan Outlet		-	-	-	-	-	-	-	-
FD-2-2 Fan Outlet		-	-	-	-	-	-	-	-
Stm. AH 2-1 Air Outlet		-	-	-	-	-	-	-	-
Stm. AH 2-2 Air Outlet		-	-	-	-	-	-	-	-
AH 2-1 Air Inlet		-	-	-	-	-	-	-	-
AH 2-2 Air Inlet		-	-	-	-	-	-	-	-
AH 2-1 Air Outlet		-	-	-	-	-	-	-	-
AH 2-2 Air Outlet		-	-	-	-	-	-	-	-
AH 2-1 Gas Inlet		-	-	-	-	-	-	-	-
AH 2-2 Gas Inlet		-	-	-	-	-	-	-	-
AH 2-1 Gas Outlet		-	-	-	-	-	-	-	-
AH 2-2 Gas Outlet		-	-	-	-	-	-	-	-
Steam & Water, Degrees F									
Feedwater to Economizer		-	-	-	-	-	-	-	-
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		-	-	-	-	-	-	-	-
Desuperheater Inlet L		-	-	-	-	-	-	-	-
Desuperheater Inlet R		-	-	-	-	-	-	-	-
Desuperheater Outlet L		-	-	-	-	-	-	-	-
Desuperheater Outlet R		-	-	-	-	-	-	-	-
Throttle Steam		1005	1005	1000	1003	1002	1002	1004	1017
Reheat-Cold at Turbine		-	-	-	-	-	-	-	-
Reheat Atemp Inlet L		-	-	-	-	-	-	-	-
Reheat Atemp Inlet R		-	-	-	-	-	-	-	-
Reheat Boiler Outlet		-	-	-	-	-	-	-	-
HP EXTR Steam Inlet		-	-	-	-	-	-	-	-
HP FW Heater Inlet		-	-	-	-	-	-	-	-
HP FW Heater Drain		-	-	-	-	-	-	-	-
Auxiliary Steam		-	-	-	-	-	-	-	-
Miscellaneous									
Burner Tilt LR ± Deg		23	+24	22	21	21	22	23	22
Burner Tilt LF ± Deg		22	+26	20	20	20	20	26	21
Burner Tilt RF ± Deg		24	+21	22	22	23	23	22	24
Burner Tilt RR ± Deg		26	+23	25	25	25	25	21	25
Flue Gas Oxygen R		2.9	3.0	2.9	3.2	3.3	3.5	3.0	3.3
Flue Gas Oxygen L		3.3	3.1	3.3	3.3	3.1	2.9	3.6	2.9
Flue Gas Oxygen Avg.		3.1	3.1	3.1	3.3	3.2	3.2	3.3	3.1
Drum Level "H_2O		+2.0	+2.0	+2.0	+2.0	+2.0	+2.0	+2.0	+2.0
FD Fan 2-1 Amps		-	-	-	-	-	-	-	-
FD Fan 2-2 Amps		-	-	-	-	-	-	-	-
ID Fan 2-1 Amps		-	-	-	-	-	-	-	-
ID Fan 2-2 Amps		-	-	-	-	-	-	-	-

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.			544	545
Test Date		1983	3/29	3/29
TEMPERATURES				
Air & Gas, Degrees F				
Ambient Air			45	46
FD 2-1 Fan Outlet			-	-
FD-2-2 Fan Outlet			-	-
Stm. AH 2-1 Air Outlet			-	-
Stm. AH 2-2 Air Outlet			-	-
AH 2-1 Air Inlet			-	-
AH 2-2 Air Inlet			-	-
AH 2-1 Air Outlet			-	-
AH 2-2 Air Outlet			-	-
AH 2-1 Gas Inlet			-	-
AH 2-2 Gas Inlet			-	-
AH 2-1 Gas Outlet			-	-
AH 2-2 Gas Outlet			-	-
Steam & Water, Degrees F				
Feedwater to Economizer			-	-
Economizer Outlet			NA	NA
Boiler Downcomer			-	-
Desuperheater Inlet L			-	-
Desuperheater Inlet R			-	-
Desuperheater Outlet L			-	-
Desuperheater Outlet R			-	-
Throttle Steam			1012	1018
Reheat-Cold at Turbine			-	-
Reheat Atemp Inlet L			-	-
Reheat Atemp Inlet R			-	-
Reheat Boiler Outlet			-	-
HP EXTR Steam Inlet			-	-
HP FW Heater Inlet			-	-
HP FW Heater Drain			-	-
Auxiliary Steam			-	-
Miscellaneous				
Burner Tilt LR ± Deg			22	22
Burner Tilt LF ± Deg			21	21
Burner Tilt RF ± Deg			24	24
Burner Tilt RR ± Deg			25	25
Flue Gas Oxygen R			3.7	2.9
Flue Gas Oxygen L			2.6	2.9
Flue Gas Oxygen Avg.			3.1	2.9
Drum Level	"H_2O		+2.0	+2.0
FD Fan 2-1	Amps		-	-
FD Fan 2-2	Amps		-	-
ID Fan 2-1	Amps		-	-
ID Fan 2-2	Amps		-	-

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		601*	602	603	604	605	606	607	608
Date	1984	3/12	3/12	3/12	3/13	3/13	3/13	3/13	3/13
FLOWS, 10E3 LB/HR									
Air Flow		-	-	-	-	-	-	-	-
Feedwater		-	-	-	-	-	-	-	-
Main Steam		2242	2165	2214	2034	2148	2155	2166	-
Reheat Steam		NA	NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		-	-	-	-	-	-	-	-
Stm. AH Extr.		-	-	-	-	-	-	-	-
Stm. AH Aux.		-	-	-	-	-	-	-	-
Condensate Flow		-	-	-	-	-	-	-	-
Superheat Spray L		42	42	-	55	37	32	21	22
Superheat Spray R		42	38	-	52	37	31	13	21
Reheat Spray		0	0	-	0	0	0	0	0
PRESSURES									
Steam & Water, Psig									
Boiler Drum		2567	2585	2533	3556	3569	3566	2540	2577
Throttle Steam		2407	2419	2388	2410	2406	2404	2420	2409
Turbine 1st Stage		1345	1355	1271	1284	1328	1329	-	1343
Turbine Cold Reheat		437	436	415	417	427	426	-	431
Reheat Inlet		NA	NA	NA	NA	NA	NA	-	NA
Extr. Steam (HP-FW)		432	430	410	411	420	420	-	424
Main Steam		2429	2445	2404	2425	2426	2426	2440	2430
Aux. Steam		334	331	332	332	333	331	-	334
Air & Gas, "H_2O									
FD Fan 2-1 Discharge		6.5	6.0	4.0	6.5	6.5	6.5	6.5	6.0
FD Fan 2-2 Discharge		7.5	7.0	5.0	7.5	7.5	7.5	7.5	7.0
AH 2-1 Air Diff.		1.6	1.6	1.5	1.6	1.7	1.7	-	1.6
AH 2-2 Air Diff.		2.0	2.0	1.8	2.0	2.0	2.1	-	2.0
Windbox Pressure L		3.5	3.0	1.5	3.0	3.5	3.0	3.0	3.0
Windbox Pressure R		3.5	3.0	1.5	3.0	3.5	3.0	3.0	3.0
WB/Furn. Diff. L		4.0	3.5	2.0	3.7	4.0	3.75	3.75	3.6
WB/Furn. Diff. R		4.0	3.5	2.0	3.7	4.0	3.75	3.75	3.6
Furnace Draft		-0.6	-0.5	-0.6	-0.3	-0.5	-0.75	-0.75	-0.6
SH Draft Diff.		0.9	0.9	0.8	0.9	1.0	0.9	-	0.9
Econ. Draft Diff.		1.7	1.7	1.6	1.7	1.7	1.8	-	1.7
AH 2-1 Gas Diff.		6.5	6.5	6.0	7.0	7.5	4.5	7.0	6.0
AH 2-2 Gas Diff.		6.5	6.5	6.0	7.0	7.5	4.5	7.0	6.5
FD Fan 2-1 Inlet		-8.9	-8.7	-8.4	-9.0	-9.0	-9.3	-8.5	-8.6
FD Fan 2-2 Inlet		-9.1	-9.0	-8.5	-9.1	-9.1	-9.4	-9.0	-9.0
Atm. Barometric "Hg		24.6	24.6	24.6	24.7	24.7	24.7	-	24.7

* Several Computer data points not available for entire test series

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		609	610	611	612	613	614	615
Date	1984	3/13	3/13	3/13	3/14	3/14	3/14	3/14
FLOWS, 10E3 LB/HR								
Air Flow		-	-	-	-	2266	2203	2318
Feedwater		-	-	-	-	-	-	-
Main Steam		-	2029	2149	2145	2235	1925	1887
Reheat Steam		NA	NA	NA	NA	NA	NA	NA
Auxiliary Steam		-	-	-	-	-	-	-
Stm. AH Extr.		-	-	-	-	-	-	-
Stm. AH Aux.		-	-	-	-	-	-	-
Condensate Flow		-	-	-	-	-	-	-
Superheat Spray L		22	51	37	23	44	44	19
Superheat Spray R		22	49	40	14	47	40	23
Reheat Spray		0	0	-	0	0	0	0
PRESSURES								
Steam & Water, Psig								
Boiler Drum		2621	2554	2568	2565	2581	2552	2533
Throttle Steam		2409	2422	2413	2411	2417	2415	2385
Turbine 1st Stage		1330	1183	1290	1273	1334	1207	1235
Turbine Cold Reheat		427	386	419	414	434	393	397
Reheat Inlet		NA	NA	NA	NA	NA	NA	NA
Extr. Steam (HP-FW)		420	381	414	409	428	389	392
Main Steam		2477	2438	2433	2428	2439	2434	2402
Aux. Steam		332	332	332	332	333	333	334
Air & Gas, "H_2O								
FD Fan 2-1 Discharge		7.5	5.0	6.5	6.5	6.5	4.5	4.5
FD Fan 2-2 Discharge		8.5	6.0	7.5	7.5	7.5	5.5	5.5
AH 2-1 Air Diff.		1.5	1.3	1.6	1.6	1.5	1.2	1.4
AH 2-2 Air Diff.		1.9	1.6	2.1	2.2	2.1	1.7	2.0
Windbox Pressure L		4.0	2.5	3.5	3.5	3.5	2.0	2.5
Windbox Pressure R		4.0	2.5	3.5	3.5	3.5	2.0	2.5
WB/Furn. Diff. L		4.5	3.2	4.1	3.8	4.3	2.3	3.1
WB/Furn. Diff. R		4.5	3.2	4.1	3.8	4.3	2.3	3.1
Furnace Draft		-0.5	-0.6	-0.6	-0.3	-0.8	-0.3	-0.6
SH Draft Diff.		0.9	0.7	1.0	1.0	0.9	0.8	0.9
Econ. Draft Diff.		1.7	1.5	1.8	1.8	1.8	1.4	1.7
AH 2-1 Gas Diff.		7.5	6.5	6.5	6.8	7.0	5.5	6.0
AH 2-2 Gas Diff.		7.5	6.5	6.5	7.3	7.5	6.0	6.5
FD Fan 2-1 Inlet		-8.6	-8.0	-9.4	-9.0	-9.0	-6.6	-8.9
FD Fan 2-2 Inlet		-8.9	-8.2	-9.6	-9.9	-10.0	-7.7	-9.9
Atm. Barometric "Hg		24.7	24.6	24.6	24.5	24.5	24.5	24.5

* Summary and Emissions data only for tests 616-620

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		601*	602	603	604	605	606	607	608
Date	1984	3/12	3/12	3/12	3/13	3/13	3/13	3/13	3/13
FAN DAMPER, % Open									
FD Fan 2-1 Inlet		50	55	55	56	56	56	56	56
FD Fan 2-1 Outlet		100	100	100	100	100	100	100	100
FD Fan 2-2 Inlet		50	55	55	56	56	56	56	56
FD Fan 2-2 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-1 Inlet		80	75	75	80	82	78	78	74
ID Fan 2-1 Outlet		100	100	100	100	100	100	100	100
ID Fan 2-2 Inlet		66	65	60	70	72	68	68	66
ID Fan 2-2 Outlet		100	100	100	100	100	100	100	100
SPRAY VALVES, % Open									
SH Spray L		30	0	30	30	10	4	30	0
SH Spray R		30	0	30	40	0	14	36	0
RH Spray		0	0	0	0	0	0	0	0
MILL DATA									
Coal Flow 2-1 10E3 LB/HR		68	65	66	69	67	68	70	70
Coal Flow 2-2		75	72	73	77	74	74	75	75
Coal Flow 2-3		76	75	75	77	75	75	78	78
Coal Flow 2-4		71	65	70	68	74	76	68	68
Coal Flow 2-5		0	0	0	0	0	0	0	0
Coal Air Temp. 2-1, °F		-	164	163	163	163	163	-	163
Coal Air Temp. 2-2		155	161	160	161	163	161	-	163
Coal Air Temp. 2-3		-	-	-	-	-	-	-	-
Coal Air Temp. 2-4		-	163	162	162	163	162	-	162
Coal Air Temp. 2-5		-	-	-	-	-	-	-	-
Mill 2-1	Amps	69	69	67	69	69	68	70	69
Mill 2-2		70	69	68	69	69	68	72	69
Mill 2-3		78	75	74	77	76	76	80	77
Mill 2-4		69	68	66	68	68	69	70	70
Mill 2-5		0	0	0	0	0	0	0	0
Exh. Discharge	"H_2O								
Mill 2-1		7.5	7.5	-	8.0	8.0	8.0	8.0	8.0
Mill 2-2		8.0	8.0	-	8.0	8.0	8.0	8.0	8.0
Mill 2-3		8.3	8.5	-	9.0	8.5	8.5	8.0	8.5
Mill 2-4		7.0	7.0	-	7.0	7.5	8.0	7.0	8.0
Mill 2-5		-	-	-	-	-	-	-	-
Diff. Press. 2-1	"H_2O	8.0	8.5	-	8.0	8.0	8.0	8.0	8.0
Diff. Press. 2-2		7.7	7.5	-	8.5	8.0	8.0	8.0	7.5
Diff. Press. 2-3		5.8	6.0	-	6.0	6.0	6.0	6.0	6.0
Diff. Press. 2-4		8.1	8.5	-	8.5	8.0	8.0	8.5	8.5
Diff. Press. 2-5		-	-	-	-	-	-	-	-
Mill 2-1 Suction		-2.1	-2.0	-	-2.0	-2.0	-2.0	-2.0	-2.2
Mill 2-2 Suction		-2.2	-2.5	-	-2.0	-2.0	-2.2	-2.0	-2.4
Mill 2-3 Suction		-2.3	-2.5	-	-2.2	-2.3	-2.5	-2.3	-2.5
Mill 2-4 Suction		-1.9	-2.0	-	-2.0	-1.9	-2.0	-1.8	-2.5
Mill 2-5 Suction		-	-	-	-	-	-	-	-
Mill 2-1 Feeder Speed % Full		74	70	-	78	80	75	78	75
Mill 2-2 Feeder Speed		75	70	-	78	80	75	78	75
Mill 2-3 Feeder Speed		75	70	-	78	80	75	78	75
Mill 2-4 Feeder Speed		75	70	-	78	80	75	78	75
Mill 2-5 Feeder Speed		-	-	-	-	-	-	-	-

* Several Computer data points not available for entire test series.

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.	609	610	611	612	613	614	615*
Date 1984	3/13	3/13	3/14	3/14	3/14	3/14	3/14
FAN DAMPER, % Open							
FD Fan 2-1 Inlet	60	54	56	56	55	48	50
FD Fan 2-1 Outlet	100	100	100	100	100	100	100
FD Fan 2-2 Inlet	60	54	56	58	55	50	54
FD Fan 2-2 Outlet	100	100	100	100	100	100	100
ID Fan 2-1 Inlet	76	78	74	79	72	62	70
ID Fan 2-1 Outlet	100	100	100	100	100	100	100
ID Fan 2-2 Inlet	68	67	64	73	66	56	66
ID Fan 2-2 Outlet	100	100	100	100	100	100	100
SPRAY VALVES, % Open							
SH Spray L	0	32	30	30	30	30	12
SH Spray R	0	38	36	36	36	36	22
RH Spray	0	0	0	0	0	0	0
MILL DATA							
Coal Flow 2-1 10E3 LB/HR	74	65	67	68	69	58	52
Coal Flow 2-2	82	70	73	74	77	64	60
Coal Flow 2-3	84	72	75	75	77	62	0
Coal Flow 2-4	84	64	66	65	66	56	52
Coal Flow 2-5	0	0	0	0	0	0	70
Coal Air Temp. 2-1, °F	163	163	164	165	165	164	162
Coal Air Temp. 2-2	163	163	163	164	164	164	161
Coal Air Temp. 2-3	-	-	-	162	162	162	-
Coal Air Temp. 2-4	163	162	163	163	163	162	159
Coal Air Temp. 2-5	-	-	-	-	-	-	164
Mill 2-1 Amps	69	68	70	69	70	69	70
Mill 2-2	68	67	69	67	68	68	69
Mill 2-3	76	76	76	76	77	77	53
Mill 2-4	69	69	68	69	68	69	72
Mill 2-5	0	0	0	0	0	0	72
Exh. Discharge "H_2O							
Mill 2-1	8.0	8.0	7.5	7.5	8.0	7.0	8.0
Mill 2-2	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Mill 2-3	8.5	8.0	8.5	8.0	8.5	8.0	6.0
Mill 2-4	7.5	7.0	8.0	7.0	7.0	6.5	7.0
Mill 2-5	-	-	-	-	-	-	6.5
Diff. Press. 2-1 "H_2O	8.0	8.0	8.0	8.0	8.0	7.5	7.5
Diff. Press. 2-2	8.0	7.5	7.5	8.0	8.3	7.0	7.5
Diff. Press. 2-3	6.0	6.0	6.0	6.0	6.0	6.5	-
Diff. Press. 2-4	8.5	8.5	8.5	8.0	7.5	7.5	7.5
Diff. Press. 2-5	-	-	-	-	-	-	6.0
Mill 2-1 Suction	-2.0	-2.3	-2.2	-2.0	-1.9	-2.5	-2.3
Mill 2-2 Suction	-2.2	-2.4	-2.2	-1.9	-1.8	-2.0	-2.5
Mill 2-3 Suction	-2.4	-2.5	-2.5	-2.2	-2.4	-2.8	-4.0
Mill 2-4 Suction	-2.5	-2.3	-2.2	-1.8	-2.0	-2.4	-2.1
Mill 2-5 Suction	-	-	-	-	-	-	-2.4
Mill 2-1 Feeder Speed % Full	72	68	72	77	78	62	64
Mill 2-2 Feeder Speed	72	68	72	77	78	62	64
Mill 2-3 Feeder Speed	72	68	72	77	78	62	-
Mill 2-4 Feeder Speed	72	68	72	77	78	62	62
Mill 2-5 Feeder Speed	-	-	-	-	-	-	80

* Summary and Emissions data only for tests 616-620

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		601*	602	603	604	605	606	607	608
Test Date	1984	3/12	3/12	3/12	3/13	3/13	3/13	3/13	3/13
TEMPERATURES									
Air & Gas, Degrees F									
Ambient Air		37	42	45	37	40	41	-	49
FD 2-1 Fan Outlet		52	55	58	53	55	57	-	65
FD 2-2 Fan Outlet		53	57	59	54	57	59	-	64
Stm. AH 2-1 Air Outlet		81	82	82	82	81	82	-	84
Stm. AH Air Outlet		86	87	79	87	87	87	-	88
AH 2-1 Air Inlet		76	81	84	79	80	81	-	86
AH 2-2 Air Inlet		-	73	71	72	74	75	-	78
AH 2-1 Air Outlet		-	480	480	475	478	477	-	477
AH 2-2 Air Outlet		490	493	494	487	489	490	-	489
AH 2-1 Gas Inlet		-	602	593	592	601	596	-	593
AH 2-2 Gas Inlet		637	636	630	625	633	632	-	627
AH 2-1 Gas Outlet		231	235	236	235	236	234	-	235
AH 2-2 Gas Outlet		234	239	243	237	237	235	-	237
Steam & Water, Degrees F									
Feedwater to Economizer		-	459	453	455	456	455	-	456
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		-	679	675	678	678	676	-	678
Desuperheater Inlet L		738	733	746	740	734	733	-	733
Desuperheater Inlet R		-	734	740	740	738	733	-	729
Desuperheater Outlet L		718	734	716	714	730	729	-	727
Desuperheater Outlet R		717	735	716	714	731	730	-	727
Throttle Steam		998	1002	1006	1006	1007	1004	1002	1008
Reheat-Cold at Turbine		-	612	612	614	615	612	-	616
Reheat Atemp Inlet L		611	612	612	615	615	612	-	614
Reheat Atemp Inlet R		591	606	605	609	610	607	-	609
Reheat Boiler Outlet		1002	986	-	1007	993	983	-	986
HP EXTR Steam Inlet		-	610	-	614	614	612	-	614
HP FW Heater Inlet		385	385	383	384	386	384	-	382
HP FW Heater Drain		395	397	396	395	397	396	-	396
Auxiliary Steam		-	636	620	620	633	641	-	642
Miscellaneous									
Burner Tilt LR ± Deg		7	-10	0	26	0	0	10	-10
Burner Tilt LF ± Deg		6	-10	0	23	0	0	10	-10
Burner Tilt RF ± Deg		7	-10	0	29	0	0	10	-10
Burner Tilt RR ± Deg		8	-10	0	19	0	0	10	-10
Flue Gas Oxygen R		-	4.6	4.5	2.8	3.9	4.2	3.5	3.6
Flue Gas Oxygen L		-	3.4	2.3	4.4	2.9	3.2	3.1	3.0
Flue Gas Oxygen Avg.		3.7	3.9	3.2	3.6	3.3	3.7	3.3	3.3
Drum Level "H_2O		0.2	0.0	0.6	0.2	0.0	-0.3	-	-0.2
FD Fan 2-1 Amps		-	109	106	112	113	112	-	109
FD Fan 2-2 Amps		114	110	108	112	113	112	-	110
ID Fan 2-1 Amps		284	243	244	249	249	248	-	246
ID Fan 2-2 Amps		-	246	245	250	249	249	-	248

* Several Computer data points not available for entire test series

APPENDIX B
BOARD AND COMPUTER DATA
UP&L, HUNTER NO. 2

TEST NO.		609	610	611	612	613	614	615*
Test Date	1984	3/13	3/13	3/13	3/14	3/14	3/14	3/14
TEMPERATURES								
Air & Gas, Degrees F								
Ambient Air		52	55	51	48	52	52	39
FD 2-1 Fan Outlet		65	67	69	67	66	66	67
FD 2-2 Fan Outlet		65	67	69	66	67	66	62
Stm. AH 2-1 Air Outlet		83	84	81	84	84	86	83
Stm. AH Air Outlet		89	85	85	86	83	85	82
AH 2-1 Air Inlet		88	89	88	88	87	89	85
AH 2-2 Air Inlet		80	80	80	79	77	79	74
AH 2-1 Air Outlet		478	479	479	475	478	475	471
AH 2-2 Air Outlet		491	491	491	489	491	487	483
AH 2-1 Gas Inlet		594	586	598	595	599	589	579
AH 2-2 Gas Inlet		630	625	637	630	627	615	615
AH 2-1 Gas Outlet		234	232	235	232	231	230	233
AH 2-2 Gas Outlet		239	240	241	241	241	240	241
Steam & Water, Degrees F								
Feedwater to Economizer		455	477	455	452	459	448	452
Economizer Outlet		NA	NA	NA	NA	NA	NA	NA
Boiler Downcomer		680	678	678	678	679	679	677
Desuperheater Inlet L		725	741	748	753	738	733	736
Desuperheater Inlet R		722	740	742	743	737	738	737
Desuperheater Outlet L		725	709	716	716	717	715	722
Desuperheater Outlet R		728	707	716	717	717	715	722
Throttle Steam		977	1009	1006	1008	1003	1008	1012
Reheat-Cold at Turbine		590	602	612	612	615	605	614
Reheat Atemp Inlet L		592	602	610	612	614	606	612
Reheat Atemp Inlet R		586	596	605	592	601	600	608
Reheat Boiler Outlet		961	1007	1007	1010	1011	1008	989
HP EXTR Steam Inlet		590	601	610	612	614	605	613
HP FW Heater Inlet		382	380	384	384	384	380	383
HP FW Heater Drain		395	390	396	394	399	391	395
Auxiliary Steam		607	614	620	616	616	626	646
Miscellaneous								
Burner Tilt LR ± Deg		-15	+12	+10	+21	+19	+15	+25
Burner Tilt LF ± Deg		-15	+12	+10	+19	+18	+15	+20
Burner Tilt RF ± Deg		-15	+12	+10	+20	+18	+15	+23
Burner Tilt RR ± Deg		-15	+12	+10	+17	+15	+15	+20
Flue Gas Oxygen R		4.9	4.3	4.6	3.0	3.1	3.2	2.7
Flue Gas Oxygen L		3.2	3.3	3.0	3.9	3.5	3.3	3.6
Flue Gas Oxygen Avg.		4.0	3.9	3.8	3.4	3.3	3.3	3.1
Drum Level "H_2O		0.2	0.2	0.4	0.3	0.0	0.1	-0.2
FD Fan 2-1 Amps		109	106	110	110	110	106	105
FD Fan 2-2 Amps		111	108	112	114	114	109	108
ID Fan 2-1 Amps		247	241	247	247	247	242	241
ID Fan 2-2 Amps		249	244	248	251	251	249	249

* Summary and Emissions data only for tests 616-620